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MEDICAL AND SURGICAL

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UNIVERSITY OF TORONTO

REPORT

OF

ST. LUKE'S HOSPITAL

YEAR ENDING SEPTEMBER 30, 1904

1416-1436 INDIANA AVENUE
AND
1427 MICHIGAN AVENUE
CHICAGO

MEDICAL
AND
SURGICAL
REPORT
OF
ST. LUKE'S HOSPITAL

YEAR ENDING SEPTEMBER 30, 1904.

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AND
1427 MICHIGAN AVENUE
CHICAGO

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LIST OF CLINICS.

OCTOBER—MAY

INCLUSIVE

1904-1905.

SURGERY	- -	WEDNESDAYS 1:30 TO 3:30 P. M.
MEDICINE	- - -	WEDNESDAYS 8 TO 9 A. M.
	- - -	THURSDAYS 9 TO 10 A. M.
	- - -	FRIDAYS 8 TO 9 A. M.
GYNECOLOGY	- -	WEDNESDAYS 9 TO 11 A. M.
OPHTHALMOLOGY AND OTOLOGY	-	THURSDAYS 2 TO 5 P. M.

THESE CLINICS ARE OPEN TO ALL PHYSICIANS.

LIST OF CASES TREATED

For the Fiscal Year ending September 30, 1904.

Department of Medicine.

Frank X. Koltes, M. D., House Physician.

DIAGNOSIS	Patients		Results			
	Male	Female	Recovered	Improved	Unimproved	Died
Infectious diseases—						
Lobar pneumonia	22	12	20	4		10
" " with pleurisy	4		4			
" " chronic nephritis	1					1
" " marasmus	1		1			
" " arthritis	1		1			
" " gonorrheal vaginitis		1	1			
" " double otitis media		1	1			
" " alcoholic gastritis	1					1
" " pediculosis of lids	1		1			
" " neuritis		1	1			
" " pulmonary abscess	1					1
" " enteritis	1		1			
Typhoid fever	16	5	19			2
" " with pneumonia and parotitis	1					1
" " relapse	1	3	4			
" " orhitis and epididymitis	1		1			
" " hæmorrhage	1	1	2			
" " thrombo-phlebitis and follicular tonsillitis	1		1			
" " pleurisy and effusion	1		1			
" " perforative peritonitis	1					1
" " otitis media	2		2			
Influenza	7	5	12			
" with cystitis	1		1			
" with pneumonia		1				1
Paratyphoid infection	3	1	4			
Varicella	2	2	4			
Syphilis— primary	2			2		
" tertiary	3			3		
" cerebral	3			3		
" " and spinal	1	1		2		
Malarial fever	5	1	6			
Scarlet fever	1		1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Infectious diseases—Continued.						
Weil's disease	1		1			
Septicaemia, with uraemia	1					1
" " pneumonia and pleurisy		1				1
Rheumatic fever (acute)	10	2	10	2		
" " with mitral insufficiency	3		1	2		
" " " aortic insufficiency	1	1		2		
Diseases of the digestive system—						
I. Stomach—						
Gastritis—acute	3	3	3	3		
" chronic	5	2		6	1	
" " with nephritis		1		1		
" " " constipation		2		2		
" " " mitral disease		1		1		
" " " hysteria		1	1			
Gastroptosis and dilatation		1		1		
Carcinoma	1				1	
" of stomach and liver	1					1
Gastric-ulcer		1		1		
Gastro-enteritis	3	4	5		1	1
" with mitral insufficiency	1			1		
" catarrhal jaundice	2			1	1	
" marasmus	5	1		1		5
II. Intestines—						
Enteritis	3	3	4		2	
" membranous with neurasthenia	1			1		
" bronchitis	1		1			
Ulcer, duodenal	1		1			
Entero-colitis	1	1		2		
Intestinal intoxication	3	1	2	1		1
Constipation	2	2	2	2		
" with neurasthenia	1			1		
Tinea saginata		1	1			
Tinea soleum	1	1	1	1		
Peritonitis, tuberculous	1	1		1		1
III. Liver and bile tracts—						
Cirrhosis-atrophic, with ascites and pulmonary oedema	1					1
Catarrhal jaundice		1	1			
Cholelithiasis	1		1			
Cholecystitis, acute	1		1			
III. Diseases of Respiratory system—						
Coryza, chronic, with neurasthenia		1	1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Diseases of respiratory system—Continued.						
Tonsillitis, acute follicular	6		6			
" with sub-maxilary adenitis		1	1			
" " salpingitis		1	1			
Pharyngitis	1		1			
Laryngitis, tuberculous	1	1		1	1	
" with goitre	1			1	1	
" " subacute bronchitis		1	1			
Pleurisy, acute	4		4			
" with effusion	2	1	1	1		1
" chronic	1			1		
" purulent	1			1		
Bronchitis, acute	6	3	8	1		
" with nephritis and rheumatism	1			1		
" " facial paralysis	1			1		
" chronic endo-carditis		1		1		
" " and emphysema	1			1		
Broncho-pneumonia	2	1	2			1
" with gastro enteritis of infancy	1					1
Asthma		2		2		
Emphysema	1	1			1	1
IV. Diseases of circulatory system:—						
Angina pectoris		2		2		
Anæmia, pernicious	2	1		2		1
" " with dementia	1				1	
" secondary, hæmorrhage from nasal polyp., chronic nephritis	1					1
Aneurism, aortic		1		1		
" with mitral insufficiency		1		1		
Arterio-sclerosis		1		1		
Endocarditis, acute	1			1		
" chronic		2		1	1	
" " with acute pericarditis	1			1		
Aortic regurgitation	1			1		
and stenosis		1		1		
Mitral regurgitation	1	1		2		
" with chronic dilatation	2			1	1	
" " cirrhosis of liver	1			1		
" obliterative pericarditis	1			1		
Pseudoangina	1			1		
Myocarditis	2			2		
" with chronic nephritis	1	3		2		

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Diseases of the circulatory system—Cont'd						
Myocarditis with arterio-sclerosis....	1			1		
" " dilatation and incompetency	3			2		1
" " dilatation and hemiplegia	1			1		
" " gastritis and bronchitis	1					1
V. Diseases of the genito-urinary tract						
Nephritis, acute parenchymatous ...	1	2	1	1		1
Nephritis, acute parenchymatous and endocarditis	1					1
Nephritis, chronic parenchymatous..	1	1		1		
Nephritis and Reynaud's disease	1			1		
Nephritis and cardiac incompetency.		2		2		
Nephritis, interstitial	13	3		10	2	4
Nephritis, interstitial with myocarditis and mitral insufficiency	2	2		3	1	
Nephritis, with pulmonary odema ...		1				1
Nephritis, with uræmia	4	2		4		2
Nephritis, with pneumonia	1					1
Nephritis, with albuminuria retinitis	1			1		
Nephritis, with chronic diffuse and arterio-sclerosis	1					1
Hæmaturia	1	1	1	1		
VI. Constitutional diseases—						
Rheumatism, chronic articular	10	3	7	6		
Rheumatism, chronic with endocarditis		2		2		
Rheumatism, chronic with bronchitis	1			1		
Rheumatism, chronic muscular	1	1	1	1		
Rachitis	2			2		
" with bronchitis	1			1		
" " tuberculous adenitis..	1			1		
" " gonorrhœal vaginitis..		1	1			
Diabetes mellitus	3	2		4	1	
Gout		1		1		
Marasmus	1	2	1			2
Malnutrition	2	2	1	1		2
Arthritic purpura	2		2			
" with suppurative otitis media	1		1			
Hodgkin's disease	1				1	
Haemophilia		1		1		
Heat exhaustion	1		1			
VI. Intoxications—						
Ptomaine poisoning	2		2			
Chronic morphinism	1					1
Illuminating gas poisoning	1		1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Intoxications—Continued.						
Carbolic acid poisoning		2			1	1
Asphyxiation, attempted drowning		1	1			
Chloral poisoning	1		1			
Atropine poisoning with epilepsy		1	1			
Acute alcoholism with delerium tremens		1		1		
Acute alcoholism with dementia	1				1	
VII. Diseases of the nervous system						
Neurasthenia	6	12	1	16	1	
" and epididymitis	1			1		
Chorea		2		2		
" and chronic endocarditis		1		1		
Tabes dorsalis	2	3		3	2	
Hysteria		5		4	1	
" with cardio-spasm		1	1			
" " mitral insufficiency and chronic constipation		1		1		
Hysteria, with cystitis		1		1		
Hystero-neuroses		1		1		
Epilepsy	2	2	1	2	1	
Cerebral haemorrhage	3	2		1	1	3
" thrombosis	3	1		3		1
" embolus		2				2
Meningitis, acute		1				1
" tuberculous	1					1
General paresis	1				1	
Bulbar paralysis	1					1
Pseudo bulbar paralysis	1					1
Insanity	1	1		1	1	
Trifacial neuralgia	1		1			
Progressive muscular atrophy	1	1			1	1
Neuritis		3		3		
" toxic		1	1			
Combined sclerosis of cord	1					1
Transverse myelitis		1				1
Landry's ascending paralysis		1				1
Myalgia		1	1			
VIII. Skin Diseases—						
Eczema, papulo vesicular	1	1	2			
" pustular		1		1		
Pityriasis rubra		1		1		
Acne	1			1		
Dermatitis venenata	1		1			
X-ray burn	1		1			
Tinea versicolor		1		1		
VIII. Miscellaneous—						
In for care, infant		1				
No diagnosis made	1	1	1		1	

Total mortality, 15.87 per cent.

Department of Surgery.

Maurice L. Blatt, House Surgeon, First Division.

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Abdomen—						
Burn	1		1			
Hernia, femoral	1	4	5			
" inguinal, double	6		6			
" " single	19	2	20	1		
" " " strangulated		1	1			
" umbilical	1	2	3			
" ventral	2	6	7			1
Neoplasm—						
Lipoma		1	1			
Fibro-sarcoma		1	1			
Sinus post-operative		1		1		
Wounds, contused	13	1	6	3	5	
" incised	1			1		
" lacerated	1			1		
Circulatory—						
Embolism, anterior tibial artery	1				1	
Epistaxis	2		2			
Hemorrhoids	17	10	25	1	1	
Nevus		5	3	2		
Phlebitis, left leg		1		1		
Varicocele, double	1		1			
" single	11		10		1	
Variocose veins	10	6	12	2	2	
Gastro-Intestinal						
Appendicitis, acute, catarrhal	1	1	2			
" " gangenous	3	1	2	1		1
" " with general peritonitis	3	1	1	1		3
Appendicitis, chronic, catarrhal	21	17	34	1	1	2
" " cystic	1		1			
" " obliterens	1	2	2	1		
" " recurrent	5	2	7			
" " with abscess	8	4	7	3		
Caecum—						
Adhesions of caput		1	1			
Actinomycosis of		1		1		
Colon, carcinome of sigmoid	1	1				2

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Gastric—						
Gastroptosis		1			1	
Neoplasm, carcinoma	1	1			1	1
Pyloric stenosis		1		1		
Vicious circle		1		1		
Intestinal—						
Neoplasm, carcinoma		1		1		
Obstruction	3	3	3		1	2
Liver—						
Abscess, actinomycotic		1				1
Cholangitis		2	1	1		
Cholecystitis	2	3	3	1		1
Cholelithiasis	2	5	6	1		
Hypetrophy, right lobe	1		1			
Neoplasm, carcinoma	1	2		1	1	1
Wound, lacerated	1		1			
Pancreas, cyst of	1			1		
Peritonitis following contusion	1					1
" septic		1				1
Rectum						
Abscess, ischio-rectal	8	3	8	2		1
Fistula, ischio-rectal	6	3	5	4		
Neoplasm, carcinoma	2		1		1	
Genital—						
Cryptorchidism	2		1	1		
Epididymus, gonorrhoeal	5		2	3		
" tuberculous	2		1	1		
Hydrocele	4		1	3		
Hypospadius	1		1			
Neoplasm, urethral carcinoma	1		1			
Penis and scrotum, trauma of	2		1	1		
Prepuce, inflammation of	1			1		
" phymosis	2		1	1		
" redundant	9		9			
Prostate, hypertrophy and carcinoma	2		1			1
" inflammation and abscess	1		1			
Orchitis	7		6	1		
Glands—						
Neoplasms						
Mammary						
Carcinoma		12	8	4		
Cysts		2	2			
Endothelioma		1	1			
Fibro-adenoma		5	5			
Thyroid						
Goitre	1	4	4	1		
Accessory thyroid		1	1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Head						
Ears, congenital malformations	1			1		
Blastomycosis	1		1			
Frosted	1			1		
Eyelids, ectropion	2		1	1		
Nose, lupus of		2	2			
Vaccine infection	1		1			
Neoplasms—						
Carcinoma of right ear	1			1		
Epithelioma of nose	2		1	1		
Epithelioma of face	1			1		
Melano-sarcoma of nose	1			1		
Papilloma	2		2			
Wounds—						
Abrasions	5	1		6		
Contusions	8	1	2	7		
Incised	13		1	12		
Lacerations	31	2	3	30		
Cinder burn	2		2			
Scalp sebaceous cyst		1	1			
Scalp wounds, contused	9		2	6	1	
" " incised	8			8		
" " lacerated	41	1	6	36		
Lower Extremities.						
Infections—						
Cellulitis, of feet	1		1			
Tuberculosis of fascia of leg and thigh	2		1	1		
Tabetic abscess	1	1	2			
Simple pyogenic	8		7	1		
Diabetic gangrene	1					1
Diabetic ulcer				1		
Neoplasm, lipoma		1	1			
" sarcoma	1				1	
Ingrown toe nails	3	1	4			
Frosted feet	4		1	3		
Wounds—						
Abrasions and contusions	70	1	9	48	15	
Crushing injuries of feet	13		0	3		1
" " " " with internal injuries	1					1
" " " legs	13		4	1		8
Lacerations	15	6	7	14		
Gunshot wounds	3		3			
Puncture wounds	15	1	1	14	1	
For skin grafting		1	1			
Lymphatics						
Adenoids	3		3			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Lymphatics—Continued.						
Glands, axillary		2	2			
" cervical, carcinomatous	1			1		
" " pyogenic	6	3	8	1		
" " tuberculous	4	6	3	7		
" " epitrochlear	1		1			
" inguinal, carcinomatus		1			1	
" " lympho-sarcoma		1			1	
" " pyogenic	11	1	7	5		
" " syphilitic	1			1		
" " tuberculous	1	1	1	1		
Peritoneum, tuberculous	1	2		1	2	
Tonsils, foreign body therein	1			1		
Muscular—						
Myalgia	3			2	1	
Wounds, contused	1			1		
" punctured	1		1			
Sprain of muscles of back	2			2		
Neck—						
Infections	4	1		5		
Neoplasms—						
Branchial cyst	1		1			
Patent hypoglossal duct	1		1			
Mixed tumor	1		1			
Epithelioma	1			1		
Carcinoma of neck		1		1		
Stab wound	1			1		
Nervous—						
Cerebral—						
Concussion	5	1	1	5		
Cerebritis, traumatic	1			1		
Hysteria, "	2			1	1	
Neoplasm, glioma	1					1
Peripheral—						
Cord, transverse myelitis	1			1		
Facial paralysis, traumatic	1			1		
Trifacial neuralgia	1	1	1			1
Laryngeal and pharyngeal paralysis.	1			1		
Spinal nerves, neuroma	1		1			
" " neuralgia	1	1	2			
" " paralysis, traumatic	2		2			
Osseous—						
Nose, fracture of bones	4	1	1	4		
" separation of cartilage	2		2			
Maxilla, inferior	6	1	6			1
Compound fracture	4		4			
Encysted tooth		1	1			
Multiple fracture with complications.	1		1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Osseous—Continued.						
Compound fracture with fracture of bones of face	1					1
Maxilla, superior						
Necrosis	1		1			
Head—						
Skull fracture involving base	9		3	2		4
With fracture of ulna and radius	1					1
Skull fracture involving base with other fractures	3		1			2
Lower extremities—						
Pelvis—						
Fracture with internal hemorrhage	1					1
" " other fractures	2		1			1
Hip joint, inflammation	1		1			
Femur—						
Dislocation	3		3			
Fracture of neck		5	1	4		
" shaft	9	1	6	4		
" with other fractures	2		2			
Neoplasm, sarcoma	1		1			
Knee—						
Floating cartilage		1	1			
Fracture of patella	2		1	1		
Sprain	1		1			
Synovitis	6	1	1	6		
" villous	1			1		
Leg—						
Fracture, Pott's	8		5	3		
" both bones above the lower quarter	11	4	7	6		2
" tibia only	8	2	4	6		
Osteomyelitis of tibia	2	2	2	2		
Ankle, sprain	7	2		6	3	
Foot—						
Fracture os calcis	2			2		
" metatarsals	4		1	3		
Tuberculous metatarsals	1			1		
Metatarsalgia		1	1			
Fracture of toes	2		1	1		
Thorax						
Fracture of ribs	6	2	2	4		2
" " with lung puncture and internal injuries	2					2
Ribs, tuberculous inflammation	1			1		
Dislocation of spine	1			1		
Fracture of spine	4		1			3

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Lower Extremities—Continued						
Spina Bifida		1	1			
Upper extremities—						
Bullet wound of scapula	1				1	
Fracture of scapula	3		1	2		
" " acromial	2		1	1		
Osteo-sarcoma of scapula	1		1			
Clavicle, dislocation of acromial end.	1			1		
" fractures	3		2			1
" " with fractures of ribs and elbow	1					1
Shoulder joint, arthritis, tuberculous.	1	1	1	1		
" " sprain	2			2		
Humerus, dislocation	7	1	5	2	1	
" fracture	5		2	3		
Elbow joint, infection	2			2		
" " lacerated wound into	1		1			
Forearm—						
Radio-ulnar dislocation		2	2			
Radio-carpal dislocation	3			3		
Colles fracture	3		1	2		
Fracture of radius	3		2	1		
" " and ulna	5	1	4	1		
Hand—						
Fracture of metacarpals	3		2	1		
Necrosis of metacarpals	1		1			
Dislocation of thumb	2	1		2	1	
Necrosis of phalanx	1		1			
Fractures of fingers, simple	10	1	4	7		
" " compound	9		3	6		
Respiratory—						
Empyema	7	1	2	4	1	1
Pulmonary gangrene		2		1		1
Thorax—						
Abscess of wall	2			2		
Contused wound	18		5	12	1	
Incised wound	2			1		1
Lacerated wound	1			1		
Skin—						
Grafts	5	7	9	3		
Xanthoma	1		1			
Upper Extremities—						
Arm—						
Infection of	2		1	1		
Foreign body	1			1		
Contused wound	12	1	2	5	6	
Incised wound	2			2		
Lacerated wound	1			1		

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Upper Extremeties—Continued.						
Forearm—						
Neoplasm, epithelioma	1			1		
Contused wound	12	2	1	11	2	
Incised wound	5		1	4		
Lacerated wound	4			4		
Hand—						
Foreign body	2		2			
Contused wound	6		1	4	1	
Crushing wound	2	1	2	1		
Infected wound	12		3	8		1
Lacerated wound	22	3	1	23	1	
Dog bite	3	3		5	1	
Fingers—						
Ankylosis	1	1				
Frosted	2			2		
Foreign bodies	3	3		4	2	
Pyogenic infection	5	2	1	6		
Gangrene	2		1	1		
Tuberculosis		1			1	
Abraded wounds	25	1		25	1	
Crushing wounds	11		5	6		
Incised wounds	17	4	1	20		
Lacerated wounds	30	1	1	30		
Urinary—						
Kidney—						
Floating	1	3	3		1	
Nephritis	2	2	1	2	1	
Nephrotomy exploratory	1			1		
Neoplasm		2	1	1		
Calculus	1	2	2	1		
Tuberculosis	3		1	2		
Perinephric hemorrhage		1		1		
Bladder—						
Cystitis	5	3	1	6	1	
Calculus	1		1			
Retention of urine	5			5		
Urethral stricture	9		5	4		
Burns—						
Extensive	6	10	8	3	5	
Minor	13	2	2	12	1	
No Diagnosis	5	3	2	2	3	1
Total cases	957	253	500	584	69	57

List of Operations.

OPERATIONS.	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Operations -						
Adenectomy—						
Adenoids	3		3			
Axillary		1	1			
Cervical	10	9	11	8		
Inguinal	14	2	7	7		
Epitrochlear	1			1		
Amputation—						
Arm	1		1			
Breast		15	13	2		
Extremity, upper	1		1			
Fingers	8		9			
Foot; tarsal and metatarsal	4		3	1		
Leg						
a. one	5		5			
b. both	1					1
Toes	4	1	4	1		
Thigh						
a. one	4		2	1		1
b. both	4		2	1		1
Appendectomy—						
Simple	32	22	50	2		2
With general peritonitis	2					2
With pneumonia		1				1
With abscess formation, see incision and drainage						
Bone operation—						
Chips	1				1	
Drilled	3	2	2	3		
Wiring	12		6	5		1
Circumcision	11		10	1		
Cystotomy—						
Suprapubic	5		1	3		1
Excision—						
Fascia	2		2			
Gasserian ganglion	1	1	1			1
Glands						
a. Submaxillary	1		1			
b. Thyroid	1	4	4	1		
Nails, fingers and toe	7	1	4	4		
Neoplasms						
a. Benign	1	2	3			

Operations—Continued.

OPERATIONS.	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Neoplasms—Continued.						
b. Cysts	3	4	7			
c. Malignant	6	2	4	4		
d. See amputation of breast						
Varicose veins	10	6	12	2	2	
Exploratory operations—						
1. Cranial	2		1	1		
2. Knee		1	1			
3. Laparotomy	2	2	1	1	1	1
4. Nephrotomy	1	1	1	1		
Gastro-intestinal -						
Cholecystectomy	1	1	1			1
Cholecystostomy	1	7	6	2		
Colostomy	1	1		1		1
Entero-enterostomy		1	1			
Enterostomy		1				1
Excision caput coli		2	2			
Gastro-enterostomy		1		1		
Kraske	1					1
Pyloroplasty		2		1		1
Resection sigmoid		1				1
Hemorrhoids—						
Clamp and cautery	13	10	21	2		
Ligation and excision	3		3			
Opening and packing	1		1			
Herniotomy—						
Femoral	1	4	5			
Inguinal						
a. Double	5		5			
b. Single	19	1	19			
Umbilical	1	2	3			
Ventral	2	7	8			1
Incision and drainage—						
Abdominal						
a. Actinomycotic		1				1
b. Appendiceal	8	4	7	3		2
c. Other than appendiceal		3		1	1	1
d. Pancreatic cyst	1			1		
Abscesses, not abdominal	32	11	22	19		2
Hematoma	4		2	2		
Hydrocele	4		1	3		
Kidney Decortication	2	2	1	2		1
Nephrectomy		1	1			
Nephrorrhaphy	1	3	3		1	
Nephrotomy		3	2	1		
Orchidectomy	6		4	2		
Orchidopexy	2		1	1		

Operations—Continued.

OPERATIONS.	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Prostatectomy, perineal	1		1			
Plastic operations	3	3	5	1		
Reduction of dislocations—						
1. Astragalus	1		1			
2. Elbow	1	2	1	2		
3. Hip	3		3			
4. Shoulder	6	1	5	2		
Removal foreign bodies	14	2	7	9	1	
Resection—						
1. Cartilage, floating		1		1		
2. Lamina		1				1
3. Long bones	1	1		2		
4. Ribs	7	2	3	5		1
Skin Graft	5	7	9	3		
Spina bifida		1	1			
Urethrotomy—						
1. Internal, sounds and urethrotome	4		1	3		
2. External	5		4	1		
Varicocelectomy	11		11			
Wound suturing, minor	89	6	19	75	1	
Total of all operations	383	162	337	174	15	19

Department of Gynecology.

James L. Fleming, M. D., House Gynecologist.

DIAGNOSIS	Admitted	Recovered	Improved	Unimproved	Died
Inflammations—					
Abscess—					
Bartholinian	3	3			
" with condylomata lata	1	1			
Pelvic	10	8	2		
" with oöphoritis	1	1			
" " general peritonitis and uræmia	1				1
" " pyosalpinx, bilateral	1				1
" " salpingitis	1	1			
" " tubo-ovarian abscess, rupturing into rectum	1	1			
Tubo-ovarian, involving appendix	1	1			
" with hydro-salpinx	1	1			
Cellulitis—					
Pelvic	1		1		
" with oöphoritis	1		1		
Condylomata lata	1	1			
Endocervicitis with chronic appendicitis	1	1			
Endometritis	27	22	4	1	
" with atresia of vulva	1	1			
" " cystic ovary	1	1			
" " endocervicitis	3	3			
" " hemorrhoids	1	1			
" " pelvic cellulitis	1	1			
" " " peritonitis	2	1	1		
" " proctitis	1	1			
Endometritis, with salpingitis	3	3			
Endometritis, with salpingitis and cystic ovary	1	1			
Endometritis, with salpingitis and pelvic abscess	1	1			
Endometritis, with salpingitis and pelvic peritonitis	1	1			
Endometritis, with tubo-ovarian abscess	1	1			
Hæmatosalpinx, with pelvic hæmatoma and pelvic peritonitis	1	1			
Hydrosalpinx, bilateral	1	1			
Hydrosalpinx, bilateral, with parovarian cyst and atrophic ovary	1	1			

DIAGNOSIS	Admitted	Recovered	Improved	Unimproved	Died
Inflammations—Continued.					
Hydrosalpinx, bilateral, with ulcerative cystitis	1	1			
Oöphoritis	1		1		
" with chronic appendicitis.	1	1			
" " pelvic peritonitis	1		1		
Peritonitis, general suppurative	1				1
" pelvic	3		1	1	1
" " with cystic ovary	1	1			
Pyelitis	1	1			
Pyelo-nephritis, ascending, with cystitis	1	1			
Pyosalpinx, unilateral	1	1			
Pyosalpinx, unilateral, with cystic ovary	2	2			
Pyosalpinx, unilateral, with infected intraligamentous cyst	1	1			
Pyosalpinx, unilateral, with ovarian abscess, retroflexion and pelvic peritonitis	1	1			
Pyosalpinx, unilateral, with pelvic cellulitis	1		1		
Pyosalpinx, bilateral	6	5		1	
Pyosalpinx, bilateral, with chronic appendicitis	1	1			
Pyosalpinx, bilateral, with mania-a-potu	1			1	
Pyosalpinx, bilateral, with pelvic abscess	2	2			
Salpingitis	12	6	5	1	
" isthmica nodosa, bilateral	2	2			
" with appendicitis	2	2			
Salpingitis, with appendicitis and oöphoritis	1	1			
Salpingitis, with general suppurative peritonitis	1				1
Salpingitis, with hemorrhoids	1		1		
" " oöphoritis	1	1			
" " ovarian cyst and appendicitis	2	2			
Salpingitis, with oöphoritis and pelvic peritonitis	2	1			1
Septicaemia, puerperal	1	1			
Vaginitis, with endocervicitis	1		1		
Vaginitis, with endometritis and pelvic peritonitis	1	1			
Vaginitis, with gonorrhœal arthritis, elbow	1		1		
Vaginitis, with urethritis	1	1			
Vulvo-vaginitis	1	1			

DIAGNOSIS	Admitted	Recovered	Improved	Unimproved	Died
Lacerations—					
Cervix, laceration of	1	1			
Cervix, laceration of, with endometritis	4	4			
Cervix, laceration of, with endometritis, no operation	1			1	
Cervix, laceration of, with endometritis and recto vaginal fistula	1	1			
Cervix, laceration of, with cystitis and cystocele	1	1			
Perineum—					
Laceration, complete	1	1			
Laceration, incomplete	7	6	1		
Laceration, incomplete, with cystocele and rectocele	5	5			
Laceration, incomplete, with endometritis	4	4			
Laceration, incomplete, with endometritis and appendicitis	3	3			
Laceration, incomplete, with endometmetris and salpingitis	2	2			
Laceration, incomplete, with endometmetris and vaginal cyst	1	1			
Laceration, incomplete, with retroflexion	3	3			
Perineum and cervix, laceration of	11	10	1		
Perineum and cervix, with endometritis	11	11			
Perineum and cervix, with endometritis and retroflexion	6	6			
Perineum and cervix, with endometritis and anteflexion	1	1			
Perineum and cervix, with endometritis and hemorrhoids	2	2			
Perineum and cervix, with endometritis and anal polypus	1	1			
Perineum and cervix, with endometritis and hematoma of both ovaries	1	1			
Perineum and cervix, with endometritis and cystocele, rectocele and procidentia	2	2			
Perineum and cervix, procidentia and hemorrhoids	1	1			
Perineum and cervix, with general enteroptosis	1		1		
Malpositions—					
Anteflexion	3	3			
" with endometritis	1	1			
" chronic appendicitis	1	1			
" " salpingitis	1		1		

DIAGNOSIS	Admitted	Recovered	Improved	Unimproved	Died
Malpositions—Continued.					
Procidentia, complete	4	4			
" " no operation	1			1	
" " with hemorrhoids	1	1			
Procidentia, complete, with pyosalpinx	1	1			
Retrodisplacement	4	3	1		
Retrodisplacement, with chronic appendicitis	5	5			
Retrodisplacement, with endometritis	6	4	2		
Retrodisplacement, with hemorrhoids	2	2			
Retrodisplacement, with imperforate hymen and amenorrhœa	1	1			
Retrodisplacement, with salpingitis and oöphoritis	1	1			
Malformations—					
Imperforate hymen	1	1			
Stenosis of cervix and Fallopian tubes, sterility, dysmenorrhœa	1		1		
Stenosis internal os with endometritis	1	1			
Neoplasms—					
Angioma, urethral	1	1			
Carcinoma, uterus, operable	6		5	1	
" " inoperable	3			3	
" Ovary	1		1		
Cysts, ovarian—					
" dermoid	2	2			
" " with chronic appendicitis	1	1			
" unilocular	3	3			
" multilocular	1	1			
" ovarian with appendicitis	1	1			
" ovarian with lacerated cervix and perineum	1	1			
" cystadenoma of ovary	1	1			
Myoma uteri	18	18			
Myoma with adenoma of breast	1		1		
Myoma with catarrhal appendicitis	3	3			
Myoma with cystic ovary and pelvic peritonitis	1	1			
Myoma with hemorrhoids	1	1			
Myoma with lacerated perineum	1	1			
Myoma with lacerated perineum and cervix, and ventral henia	1	1			
Myoma with pregnancy	1	1			
Myoma with septic peritonitis	1				1
Myoma with stenosis of cervix	1	1			
Myoma with acute hemorrhagic nephritis following ether anæsthetic	1				1
Polypus-uteri, with hemorrhoids	3	3			
Sarcoma, ovary	1		1		

DIAGNOSIS	Admitted	Recovered	Improved	Unimproved	Died
Disorders of gestation and sequelæ—					
Abortions, incomplete	5	5			
" threatened	1	1			
" complete	2	2			
" incomplete with hæmophilia	1	1			
" complete with venereal warts	1	1			
Ectopic gestation	7	7			
Ectopic gestation, with catarrhal appendicitis	1	1			
Ectopic gestation, with myoma uteri	1	1			
Hydatid mole	1	1			
Hyperemesis gravidarum	1	1			
Miscellaneous—					
Dysmenorrhœa	3	3			
" with sterility	2	2			
In for examination under anæsthesia	3	3			
Diagnosis not made	1		1		

List of Operations.

OPERATIONS.	Admitted	Recovered	Improved	Unimproved	Died
Abscess, pelvic, incision and drainage	16	13	1		2
Abscess, pelvic, incision and drainage, with curettage	3	3			
Anteflexion, Dudley's operation for	2	2			
Anteflexion, Dudley's operation for with appendectomy	1	1			
Cauterization of urethral angioma	1	1			
Colporrhaphy, anterior	1	1			
Curettage	42	37	5		
Curettage, with operation for hemorrhoids	3	3			
Cystoscopic examination	1		1		
Examination under anæsthesia	4			4	
Excision of infected Bartholinian glands	4	4			
Excision of infected Bartholinian glands and condylomata lata	1	1			
Excision of condylomata lata	2	2			
Exploratory incision of cervix for diagnosis	2			2	
Exploratory laparotomy	2		1		1
Exploratory laparotomy and curettage	1		1		
Exploratory laparotomy and perineorrhaphy	2	1	1		
Hemorrhoid, operation for	2	2			
Hæmotocele, drainage of	1	1			
Hystero-myomectomy, abdominal	10	9			1
Hystero-myomectomy, and appendectomy	1	1			
Pon-hysterectomy, abdominal	8	6	1		1
Pon-hysterectomy, abdominal, with hemorrhoid operation	1	1			
Hysterectomy, vaginal	5	5			
Hysterectomy, vaginal, with perineorrhaphy	2	2			
Hysterectomy, vaginal, with perineorrhaphy and anterior colporrhaphy	2	2			
Hysterectomy, vaginal, with hemorrhoid operation	1	1			
Hysterorrhaphy, abdominal	4	4			
Hysterorrhaphy, abdominal, with appendectomy	4	4			

Operations—Continued.

OPERATIONS.	Admitted	Recovered	Improved	Unimproved	Died
Hysterorrhaphy, abdominal, with curettage	3	3			
Hysterorrhaphy, abdominal, with curettage and perineorrhaphy	1	1			
Hysterorrhaphy, abdominal, with curettage, perineorrhaphy and trachelorrhaphy	2	2			
Hysterorrhaphy, abdominal, with appendectomy, curettage, trachelorrhaphy, and perineorrhaphy	1	1			
Hysterorrhaphy, abdominal, with excision of cyst of brood ligament and plastic on tubes	1	1			
Hysterorrhaphy, abdominal, with perineorrhaphy	2	2			
Hysterorrhaphy, abdominal, with salpingo-oöpharectomy, unilateral	1	1			
Hysterorrhaphy, vaginal, with curettage	3	3			
Hysterorrhaphy, vaginal, with curettage and trachelorrhaphy	1	1			
Hysterorrhaphy, vaginal, with curettage, trachelorrhaphy and perineorrhaphy	1	1			
Hysterorrhaphy, vaginal, with excision of cervical polypus	1	1			
Hysterorrhaphy, vaginal, salpingo-oöphorectomy-bilateral	1	1			
Manual replacement of uterus	2	2			
Manual replacement of uterus, curettage and incision of hymen	1	1			
Manual replacement of uterus, curettage and hemorrhoid operation	1	1			
Myomectomy, abdominal	4	3			1
Myomectomy, with appendectomy	2	2			
Myomectomy, with ventral herniotomy, trachelorrhaphy and perineorrhaphy	1	1			
Myomectomy, vaginal	1	1			
Myomectomy, vaginal with perineorrhaphy	1	1			
Myomectomy, vaginal, with curettage and salpingo-oöpharectomy	1	1			
Oöphorectomy	1	1			
" with appendectomy	4	4			
" " " and curettage	1	1			
Oöphorectomy, with appendectomy, curettage, trachelorrhaphy and perineorrhaphy	1	1			

Operations—Continued.

OPERATIONS.	Admitted	Recovered	Improved	Unimproved	Died
Oöphorectomy, with perineorrhaphy.	1	1			
" ovarian cyst	4	4			
Perineorrhaphy	7	7			
" and trachelorrhaphy.	4	4			
" " curettage	8	9			
" with curettage and trachelorrhaphy	15	15			
Perineorrhaphy, with curettage and Schroeder's operation	3	3			
Perineorrhaphy, with Schroeder's operation	1	1			
Perineorrhaphy, with curettage, Schroeder's operation, hemorrhoids, and removal of vaginal septum	1	1			
Perineorrhaphy, curettage, trachelorrhaphy, and division of rectal stricture	1		1		
Perineorrhaphy, with anterior colporrhaphy	6	6			
Perineorrhaphy, with anterior colporrhaphy and trachelorrhaphy	1	1			
Perineorrhaphy, with anterior colporrhaphy and cystoscopic examination	1	1			
Perineorrhaphy, with anterior colporrhaphy and removal of hemorrhoids	1	1			
Perineorrhaphy, with trachelorrhaphy, excision of Bartholinian cyst and oval polypi	1	1			
Perineorrhaphy, with curettage and excision of vaginal cyst	1	1			
Perineorrhaphy, with curettage and appendectomy	1	1			
Perineorrhaphy, with appendectomy.	1	1			
Salpingectomy, unilateral, abdominal	5	4	1		
Salpingectomy, bilateral	8	8			
Salpingectomy, bilateral, with Alexander's operation	1				1
Salpingectomy, bilateral, appendectomy	2	2			
Salpingo-oöpharectomy, bilateral, abdominal	6	6			
Salpingectomy, bilateral, oöpharectomy unilateral, with resection of other ovary	2	2			
Salpingo, oöpharectomy with appendectomy	7	7			

Operations—Continued.

OPERATIONS.	Admitted	Recovered	Improved	Unimproved	Died
Salpingo, oöpharectomy, with curettage	2	2			
Salpingo, oöpharectomy, with excision of brood ligament cyst	1	1			
Salpingectomy, unilateral vaginal	1	1			
Salpingectomy, unilateral, vaginal, with curettage	2	2			
Salpingectomy, unilateral, vaginal, with curettage and perineorrhaphy	1	1			
Salpingo, oöpharectomy, unilateral resection of ovary, curettage trachelorrhaphy	2	2			
Schroeder's operation	3	3			
Schroeder's operation with curettage	5	5			
Trachelorrhaphy	2	2			
" with curettage	4	4			
" " anterior colporrhaphy	1	1			
Urethrotomy	1	1			
Vaginal section, drainage for suppurative pelvic peritonitis	1				1
Totals	282	255	13	6	8

Mortality, 2.83 per cent.

Summary of Most Important Operations.

OPERATIONS.	Admitted	Recovered	Improved	Unimproved	Died
Abscess, pelvic, incision and drainage	20	13	13		1
Anteflexion, Dudley's operation for..	4	4			
Appendectomy	32	32			
Colporrhaphy, anterior	13	13			
Curettage	110	103	7		
Excision of infected Bartholinian glands	8	8			
Exploratory laparotomy	5	1	3		1
Hemorrhoid, operations for	10	10			
Hysterectomy, abdominal	9	7	1		1
" vaginal	7	7			
Hystero, myomectomy, abdominal ...	10	9			1
Hysterorrhaphy, abdominal	19	19			
" vaginal	7	7			
Manual replacement of uterus	4	4			
Myomectomy, abdominal	7	6			1
" vaginal	3	3			
Oöpharectomy	16	16			
Perineorrhaphy	71	69	2		
Resection of ovary	4	4			
Salpingectomy, unilateral, abdominal	5	4	1		
Salpingectomy, bilateral, abdominal..	13	12			1
Salpingectomy, unilateral, vaginal ..	4	4			
Salpingo, oöpharectomy, unilateral, abdominal	11	10	1		
Salpingo, oöpharectomy, bilateral, abdominal	7	7			
Salpingo, oöpharectomy, unilateral, vaginal	4	4			
Schroeder's operation	12	12			
Trachelorrhaphy	38	37	1		

Obstetrical Department.

James L. Fleming, House Obstetrician.

Patients remaining Oct. 1, 1903, women	9	
" " " " babies	6	
		15
Patients admitted during year, women	117	
Births, male	52	
" female	51	
		220
		235
Patients discharged, women	118	
" " babies	94	
" transferred, women who developed mastitis two weeks after delivery	1	
" died, babies	7	
Still-births	5	
Patients remaining Sept. 30, 1904, women	7	
" " " " babies	6	
		235
Mortality, mothers	None	
" babies	6.8	

Cause of Death of Babies.

Premature birth	2
Aspiration pneumonia	1
Icterus neonatorum	1
Malnutrition	1
Patulous foramen ovale	1
Unknown	1
	7
Forceps	8
Episiotomy	3
Craniotomy, eclampsia,—foetus dead	1
Removal of adherent placenta	1

Presentations.

Cephalic:		
L. O. A.	71	
R. O. A.	23	
Persistent R. O. P.	3	
		97
Breech:		
R. S. P.	1	
R. S. A.	2	
L. S. A.	3	
		6
		103

Department of Ophthalmology.

John W. Dreyer, M. D., House Surgeon, Second Division.

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Eye- -						
Cataract senile	9	12	13	6	1	
" double	2			1	1	
" congenital	2		2			
" secondary		2	2			
" traumatic		10	4	6		
Iritis	2	5	5	2		
" tubercular		1			1	
" specific	1	1		2		
"	1		1			
Irido cyclitis		3	1		2	
" " traumatic		1		1		
Uveitis	2	2	3	1		
Iritis and conjunctivitis		3		1	2	
Choroiditis	1	6	1	9		
Chorio-retinitis		2	1	1		
Keratitis		1		1		
" ulcerative	5	6	8	3		
" interstitial	1			1		
" ulcerative-following burn		2	2			
" " and symblepheron		1	1			
Conjunctivitis-acute catarrhal	1	1	2	5	1	
" phlyctenular and keratitis		1		1		
" traumatic		2		2		
Trachoma	2	2	3	1		
Conjunctival tumor		1	1			
Pterygium	2	3	4	1		
Strabismus-divergent	1	7	10	1		
" convergent		2	2			
Entropion		1	1			
Entropion with defective upper lid	1			1		
Entropion-trichiasis and symblepharon	1			1		
Symblepharon	2		2			
Granuloma lower lid		1	1			

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Eye—Continued.						
Pediculosis of lids		1	1			
Chalazion		1	1			
Cellulitis-orbital-specific	1			1		
Abscess-intra-ocular	1		1			
Ptosis-double		1	1			
" single	1			1		
Nebula of cornea central	2			2		
Synechia-posterior		1		1		
Staphyloma-anterior		1	1	enucleated		
Glaucoma-double	2	1		3		
" following old injury	1		1	enucleated		
Retinitis-albuminuric (parenchym nephritis)		2	1	1		
Amblyopia-toxic		1		1		
Dacryocystitis	3	1	2	2		
" and stenosis of nasal duct	1	1	1	1		
Stenosis of nasal duct	3	1	4			
Ophthalmia neonatorum	2	1	2			1
" gonorrhoeal-adult		1	1			
Glioma	1			1		
Sarcoma, orbital		2	1		1	
Carcinoma inner canthus and frontal sinus (left)		1		1		
Cholesteatomatous tumor and frontal sinus abcess	1		1			
Injury to eyeball		5	1		1	
Panophthalmitis		4	4			
Prolapse of iris		1	1			
Incised wound of sclera and conjunctivitis		1	1			
Wound of sclera		2	1	1		
Corneal abrasion		2		2		
Incised wound of conjunctiva		1			1	
Rupture cornea and iris		2	2			
Penetrating wound of eyeball		3	1	1	1	
Perforation of cornea		2	1	1		
Laceration " "		2	1	1		
" of cornea and iris		1	1			
Steel in anterior chamber		1	1			
Atrophy of eyeball following trauma		1	1			
Ulcerated stump following Muhl's operation		1	1			
Foreign body in eye (Corneal)		40	35	3	2	
" " " " and acute conjunctivitis		1		1		
Total	63	171	146	73	15	1

Mortality 42.100%

†Eye enucleated. *To return for operation

OPERATIONS—EYE.

Plastic for entropion	2
" " ectropion	1
" " ptosis	3
" " symblepharon	2
Granuloma of lid—excised	1
Grattage for trachoma	1
Tarselectomy for trachoma	4
Removal of pterygium	9
" " conjunctival tumor	2
Operation for chalazion	1
Cauterization of corneal ulcer	1
Paracentesis of anterior chamber	1
Tenotomy	5
Advancement	11
Iridectomy	15
Breaking up posterior synechia	1
" " anterior "	1
Cataract extraction	16
" needling	11
Haab magnet operation	4
Enucleation	14
" and evisceration of orbit	1
Removal of foreign body of the cornea	36
Plastic on stump of eyeball	1
Intraocular abscess drained	1
Frontal sinus opened and drained	3
Cystic lachrymal duct excised	1
Opening obstructed nasal duct	9
Total	158

Department of Otology.

John W. Dreyer, M. D. House Surgeon, Second Division.

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Otitis media, acute	3	3	3	3		
Otitis media, acute, double		1	1			
Otitis media, chronic	5	12	16	1		
Otitis media, chronic, double	1	2	3			
Mastoiditis, acute	7	6	12	1		
Mastoiditis, acute, double		1	1			
Mastoiditis, chronic	2	1	2			
Right mastoiditis, and left otitis media, acute		1		1		
Mastoiditis (acute double), and meningitis		1			1	
Inflammation of drum membrane		1		1		
Nerve deafness	1			1		
Aural polypi	1		1			
Prominent auricles	1		1			
Gumma of external auditory canal and reflex	1		1			
Mastoid pain	1		1			
Supposed pin in ear	1		1			
For mastoid repair	1		1			
Total	24	29	42	10	1	

*No operation.

†Discharged soon after operation. Further treatment at home.

OPERATIONS.

Radical mastoid	35
For mastoid abscess	5
Mastoid repair	1
Ossiculectomy	1
Paracentesis, of drum head	2
Removal aural polypi	1
Plastic on middle ear	1
Plastic on auricles	1
Total	47

Department of Rhinology and Laryncology.

John W. Dreyer, M. D., House Surgeon, Second Division.

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Rhinitis—atrophic	1			1		
Ulcer nasal septum—syphilitic		1		1		
Frontal sinus—catarrh	1			1		
Deflected septum	3	3	6			
" " with adhesion	1		1			
Hypertrophied turbinates	1	1	1	1		
Empyema of Highmore's antrum	1	3	5			
Empyema of Highmore's antrum and stricture of nasal duct	1	1	1	1		
" " " and nasal spur	1			1		
Empyema of Highmore's antrum and nasal polypi	1		1			
Aneurysm of Highmore's antrum	1			1		
Adenoids	2	1	3			
" and deviated septum		3	3			
" and hypertrophied tonsils	9	2	11			
Hypertrophied tonsils	7	2	9			
Tonsilitis—suppurative		1	1			
" and hypertrophied turbinates	1		1			
Peritonsilar abscess		1	1			
Laryngitis—chronic, syphilitic		1		1		
Ethmoiditis purulent	1			1		
	36	23	50	9		

OPERATIONS.

Adenectomy	13
Tonsilectomy	28
Turbinectomy	25
Operation for nasal spur	8
Straightening nasal septum	3
Removal nasal polypi	1
Asch's operation on nasal septum	2
Curetment of septum for ulcer	1
Drainage of ethmoiditis	1
Drainage of peritonsilar abscess	1
Total	83

Department of Oral Surgery.

John W. Dreyer, M. D., House Surgeon, Second Division.

DIAGNOSIS	Patients			Results		
	Males	Females	Recovered	Improved	Unimproved	Died
Cystic tumor of jaw		1	1			
Impacted tooth		1	1			
Impacted tooth and encysted tooth		1	1			
Carious tooth	1			1		
Epulis, inferior left maxilla		1	1			
Hare lip	1		1			
Cleft palate	3		1	*1	1	
Cleft palate and hare lip	1	1		2		

*To return for second operation.

OPERATIONS.

Plastic on hare lip	4
Staphylorraphy	3
Drainage of antrum of Highmore	4
Extraction of impacted tooth	2
Removal of cystic tumor of lower jaw	1
Removal of epulis of lower jaw	1
Packing cavity of carious teeth	1
Total	16

Department of Orthopedic Surgery.

John W. Dreyer, M. D., House Surgeon, Second Division.

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Hip dislocation, congenital	24	4	8	20		
Hip dislocation, post osteo-myelitic, acute		1		1		
Hip dislocation, post osteo-arthritic	2			2		
Hip dislocation, traumatic, old	1				1	
Exostosis of hip		1		1		
Coxa vara		1		1		
Ankylosis of hip, fibrous, following hip reduction		1		1		
Ankylosis, bony, post osteo-myelitic		1	1			
Tubercular coxitis	6	6	1	11		
Tubercular osteo-arthritis and sinus	1	1		2		
Tubercular osteo-arthritis and contractures	1	2	1	1		
Tubercular osteo-arthritis and abscess		1		1		
Genu valgum, congenital	3	2	1	4		
Genu valgum post paralytic	2			2		
Genu varum	1			1		
Goneitis, tuberculous	1	2	3			
Ankylosis of knee	2			2		
Osteo-arthritis, of ankle, tubercular	2			2		
Bursitis tendo-Achilles		1		1		
Achillodynia	1				1	
Pes Equines, congenital		2		2		
Pes Equines-varus, congenital		1		1		
Pes Equines, paralytia	1			1		
Pes Equines, traumatic		1		1		
Talipes varus, congenitalio		1		1		
Pes varus	3	2	2	3		
Pes varus calcaneus	1			1		
Pes planus, paralytic		1		1		
Pes valgus, congenital		1		1		
Pes valgus, paralytic	1	1	1			
Talipes plantaris	2			2		
Spastic paraplegia	2	6		8		

DIAGNOSIS	Patients		Results			
	Males	Females	Recovered	Improved	Unimproved	Died
Spastic monoplegia		1		1		
Tubercular spondylitis	1			1		
Tubercular spondylitis, cervical		1		1		
Tubercular spondylitis, dorsal		2		2		
Torticollis	1	1		2		
Infantile paralysis	1	5		5	1	
Traumatic epiphysiolysis with subluxation head of humerus		1	1			
Ankylosis of elbow, gonorrhoeal	1		1			
Contracture of arm		1	1			
Contracture of thigh	4	2		6		
Contracture of hip		2		2		
Contracture of knee		3	1	2		
Contracture of tendo-achilles		1	1			
Contracture of flexor tendons of toes	2	1		3		
Contracture of post cervical muscles	1			1		
Contracture rheumatic (not classified)		1		1		
Contractures following prolonged cast application (not classified)		3		3		
	68	70	20	115	3	

Note.—Six cases of congen. hip disloc. returned for second cast; two for third cast.

OPERATIONS.

Tenotomy	50
Reduction, congenital dislocated hips	24
Transposition " " "	5
Redressement, hip	13
Drainage tubercular abscess of hip	4
Drainage of tubercular abscess of knee	2
Injection tubercular abscess of knee	1
Curetment of tubercular abscess of ankle	1
Evacuation of tubercular spinal abscess	1
Osteotomy	4
Osteoclasis	2
Myotomy	2
Tendon transplantation	7
Breaking up adhesions about joint	7
Forcible correction of contracture	5
Forcible extension of spine	2
Forcible correction of genu valgum	6

Operations—Continued.

Forcible straightening of knee for contracture	1
Forcible straightening for pes varus	1
Forcible straightening for pes valgus	1
Forcible straightening for pes planus	1
Forcible straightening for pes equinis varus	1
Reposition of dislocated shoulder	1
Reposition of dislocated scaphoid	1
Drainage of bursa mucosa tendo-achilles	1
Total	141

Report of Laboratory.

Thos. L. Dagg, M, D., Attending Pathologist.

There have been received from the surgical service for examination during the year 300 specimens, which have been classified as follows:

Curettements—
48 cases in all—

Glandular endometritis	19
Interstitial endometritis	3
Diffuse endometritis	17
Decidual endometritis	6
Hemorrhagic endometritis	1
Malignant endometritis	2

Tuberculosis—
32 cases—

Glandular	18
Osseous	5
Internal organs	8
Skin	1

Appendicitis—
40 cases—

Acute catarrhal	15
Interstitial, chronic	20
Gangrenous	4
Obliterans	1

Salpingitis
17 cases

Purulent	8
Chr. Catarrhal	8
Acute	1

Malignant tumors
35 cases in all—

Carcinoma glandular	17
Epithelioma squamous cell	9
Endothelioma	4
Sarcoma	5

Benign Tumors

79 cases—

Goitre	5
Uterine polyp	3
Cyst adenoma	1
Fibroma	19
Myofibroma	12
Adenofibroma	3
Hydatid cyst	1
Galactocele	2
Adenitis, simple	11
Papilloma	6
Dermoid	2
Enchondroma	1

Miscellaneous specimens—

27 cases

Actinomycosis	1
Wound infection by gas bacillus of Welch causing death	1
Post partum diptheritic vaginitis and cervicitis	1
Gastric ulcer	1
Benign sigmoiditis	1
Cervical erosion	3
Simple inflammatory processes	19

During the year 22 autopsies were performed, and with only a few exceptions were complete. From among them the following cases are detailed as presenting unusual and interesting features:

1855, male, 25. This was a patient who died of general peritonitis due to a perforating ulcer of the ileum in the course of typhoid fever, fourth week. Temperature remained high throughout the disease, responded poorly or not at all to the baths, and was accompanied by more or less delirium. On the eighteenth day of disease baths were stopped and sponges substituted, but did not improve; pulse grew weaker. Twenty-third day pulse irregular, volume poor; complains of pain. Twenty-fourth day, at 5 A. M., he suddenly went into state of collapse, restless, apprehensive and in great pain. Abdomen became rigid, pulse went from 108 to 150 and he died at 11 A. M. on a clinical diagnosis of perforation.

Autopsy findings:

General sero purulent peritonitis.

Perforation of ileum 8 c.m. from ileo caecal valve opposite the mesenteric attachment and in the base of a large, deep ulcer.

Numerous ulcers of varying size and depth involve the lower two feet of ileum and first portion of colon. A well developed Meckel's diverticulum is present, with opening into intestine pointing downward and protected

Fig. I.

from above by a valve like extension of the mucosa of the ileum. There is acute splenic tumor, cloudy swelling of liver and heart; acute nephritis; lungs normal. The typhoid bacillus was isolated in pure culture from the spleen and the heart's blood. A mixed culture obtained from the peritoneal fluid of stophylococci and bacilli, but no typhoid found.

Fig. 1 shows the lower portion of the ileum with a large ulcerating area, and in the bottom of one of the ulcers the perforation.

1578, Still Born Male.

Clinical diagnosis, congenital syphilis.

Autopsy findings:

Congenital stenosis of the œsophagus and duodenum. Distension of stomach and intestine by retained secretions. Fibrous cholecystitis; fibrous apical pleuritis, with deformity of right apex. Multiple hemorrhages in lungs. Uric acid deposits in kidney. Premature infant, etc.

The interesting points in this case are the congenital stenosis, one in the œsophagus, which is normal in its upper part for a distance of 3.5 c.m., after which the lumen comes abruptly to an end. There is no trace of the œsophagus beyond that point except a fibrous cord 12 M.M. long. At the lower end of the cord, which is about on a level with the bifurcation of the trachea, the lumen of the œsophagus again begins. This end is also considerably dilated.

The other congenital defect is a stenosis of a portion of the duodenum, occlusion being complete at a point immediately below the head of the pancreas, where a few lymph glands are also found. At the point of termination of the lumen there is a firm nodule of tissue which passes upward to communicate with the duodenum above. There is a separation between this and the end of the duodenum of about 5 M.M. in which no remnant of the lumen is present. The end of the duodenum is greatly dilated and is globular, and about 3 c.m. in diameter. The dilation ceases at the hilum of the liver. Histologically, a section through the fibrous cord at the point of stenosis in the œsophagus shows an entire absence of epithelial lining or glandular structure.

Another interesting feature is the bacteriology in this case, since there were two specific micro-organisms culti

vated from the lungs and liver; the heart's blood being found sterile.

First: A micrococcus, diplococcus in form, capsule appearing circular in hanging drop; non-motile; stains by Gram for capsule only with partial success. Litmus milk acidified in 24 hours, followed by coagulation. On agar slant a very delicate, slightly raised, transparent, granular growth; no growth on potato; no indol reaction. Bouillon shows a light turbidity and a granular precipitate.

Diagnosis: Micrococcus capsulatus (Fraenkel's pneumo-coccus).

Second: Morphology variable. It appears in coccilike forms and also bacilli of ranging lengths. The majority appear as bacilli rather longer than broad, forming chains of two or four in number, diplobacillus forms. Appears capsulated in hanging drop, the capsule conforming to the organism in shape. On agar slant it forms in 24 hours an opaque, slightly raised, vigorous growth. No liquification of gelatine; appears finely granular on gelatine plates, with even, transparent edges. Growth on potato very showy and vigorous, pale yellowish white and glossy, becoming discolored in 24 hours and giving off a sour odor. In bouillon it gives a gelatinous growth with precipitate acidifies Litmus milk in 24 hours and coagulates in 48 hours. On glucose agar produces gas. No indol. Diagnosis: Bacillus mucosus capsulatus (Friedlander's pneumo-bacillus).

1562, Male, 71.

Operation, removal of gasserion ganglion for pain.

Recovery from operation was rapid, with normal temperature, till the seventh day, he having been walking about his room since the fourth day following operation. Suddenly, on the fourth day, he was taken with chill; temperature shot up from 98.8 to 103 at 9 P. M. and remained high, ranging from 100 to 104.8; pulse, 110 to 152 till twelfth day, when he died, with the clinical

symptoms of cerebral meningitis. At autopsy the wound was found clean, no evidence of suppuration in operative area, but below the site of the gasserion ganglion the sphenoidal sinus is found filled with a thin pus. The other sinuses and middle ear show no changes; yellow pus was also found exuding from the hypophysis cerebri. The fact that the operative field was perfectly clean, that patient was well and without symptoms whatever till seventh day, would indicate that the trouble arose from an old, latent infection which became active following the present operation owing to decreased resistance in the tissues. Two organisms were isolated from the pus found in the sinus and gave the cultural characteristics respectively of micrococcus tetragenous and bacillus mucosus capsulatus the latter also being isolated from the spleen.

1842. Female 42.

Patient had been sick for two years with intermittent dragging pains in right lumbar region. Operated upon for pyonephrosis and ureteral stones, and a large quantity of greeenish pus was evacuated. Drainage was left in pelvis of kidney which continued to discharge for about 5 months when she was again admitted with symptoms of acute intestinal obstruction. An enterostomy was quickly done but without relief and patient died in a few hours.

A full post mortem could not be obtained but the diseased kidney was removed with difficulty owing to the extensive fibrous adhesions which had formed all about it from the chronic inflammatory process. Upon opening it we found several large pockets filled with a thick greenish pus, the cavities being separated by dense fibrous partitions, the glandular structure of the organ being entirely lost. The histology of the tissue shows almost complete necrosis of the glandular structure and a substitution of firm fibrous tissue. The opposite kidney was normal, although enlarged and had evidently done the work of both organs for some time. Fig. 2 shows a cut section of the

kidney with its large pus cavities; and also the firm white fibrous-appearance of the kidney structure.

1782. Male 42.

Porter by occupation. A moderate drinker. Previous personal history and family history negative. Patient was admitted on 10th day of the disease, which came on abruptly with chill and high fever. Temperature upon entrance

Fig. II.

102.6, pulse 120, respiration 28. Leucocyte count of 33200. He had all the physical signs for lobar pneumonia. His temperature was very variable throughout the course of the disease, ranging from 104 to sub normal 97.4. The man was constantly cyanotic throughout and died on the

16th day of the disease. The destructive process shown in the lung at post mortem indicates a most virulent infection, rapid in its course. The saprophytic toxaemia incident to the existing gangrene no doubt contributed to the quickly fatal issue.

Autopsy findings: Unresolved lobar pneumonia of lower and middle lobes; gangrene of middle lobe and lower margin of upper lobe; diffuse suppuration in the lower and middle lobes; pleuritis over right lower lobe; bilateral adhesive fibrinous pleuritis; small abcess in left upper lobe; hypostatic congestion in left lower lobe: compensatory pulmonary emphysemia and oedema; fatty infiltration of liver; cloudy swelling of spleen and kidneys; nodular sclerosis of aorta, etc.

Histological sections show all stages of pneumonic process, necrosis, abscess and gangrene; the liver showing fatty infiltration and degeneration.

1781, Male, age 14 months, colored.

Father (colored) died of tuberculosis. Mother (white) in good health. The child for six months previous to admission to hospital was unwell; was peevish, cried a great deal when handled and never appeared robust. Upon admission which was two months before death, a physical examination showed: development good, nutrition fair; expression dull and stupid; the tongue had a slight moist coating; circulation normal; respirations rapid, shallow, jerky and irregular; the head was retraced well backward. Auscultation showed areas of large moist rales over lower lobe of right lung; bronchial breathing with a prolonged expiratory tone. There was protruding abdomen, tympanitic, with liver and spleen easily palpable. The osseous system shows a distinctly rachitic condition throughout, fontanelles widely open, sutures not firmly closed, areas of softening or thinning in occipital region (craniotabes) ends of the long bones enlarged and the rachitic "rosary" well marked in the ribs. Cervical lymphatics enlarged especially on the right side. The child remained

listless and dull with more or less retraction of the head, the latter not being constant, however, but only at intervals. He gradually lost in weight and his general condition grew steadily worse, developing symptoms of cerebral irritation, such as nystagmus, strabismus, unequal pupils, twitching of the mouth, etc. Finally Cheyne-Stokes breathing and becoming comatose. The range of temperature which occurred in this case is a remarkable illustration of what extremes can sometimes be reached and still recovery from its immediate effects as can be seen by reference to the accompanying chart, his temperature reaches four times upon different days to above 107 degrees Fahr., twice going above 108 degrees, reaching 108.6 degrees twenty days before his death. Pulse was high throughout, 116 to 130, being increased only slightly, 140 to 158, during the high temperatures; respirations increasing from 30 up to 68.

Post-portem finding: General miliary tuberculosis. General tubercular lymphadenitis of mesenteric, retro-peritoneal, cervical, peri-bronchial, mediastinal and oesophageal glands; tubercular, bronchial pneumonia right middle lobe, miliary tuberculosis of both lungs, liver, diaphragm, peritoneum, nodular tubercles in brain, tubercular basilar meningitis, moderate hydro-cephlus; hyperplasia and ulcerations of Pyer's patches and solitary follicles. Tubercular caries of dorsal vertebrae, rachitic osteo-chondritis, patent anterior fontanelle, thrombosis superior longitudinal sinus and lateral sinuses.

The accompanying temperature chart, Figs. 3 and 4, indicates the temperature curve for thirty-nine days preceding death.

1663, Female, age 36.

Actinomycosis. See report of this case in special article by Dr. McArthur. I wish to acknowledge here the valuable assistance of Dr. C. S. Owen and Dr. J. G. Lovell of the Hospital Interne Staff, in preparing accompanying photographs of the pathological material.

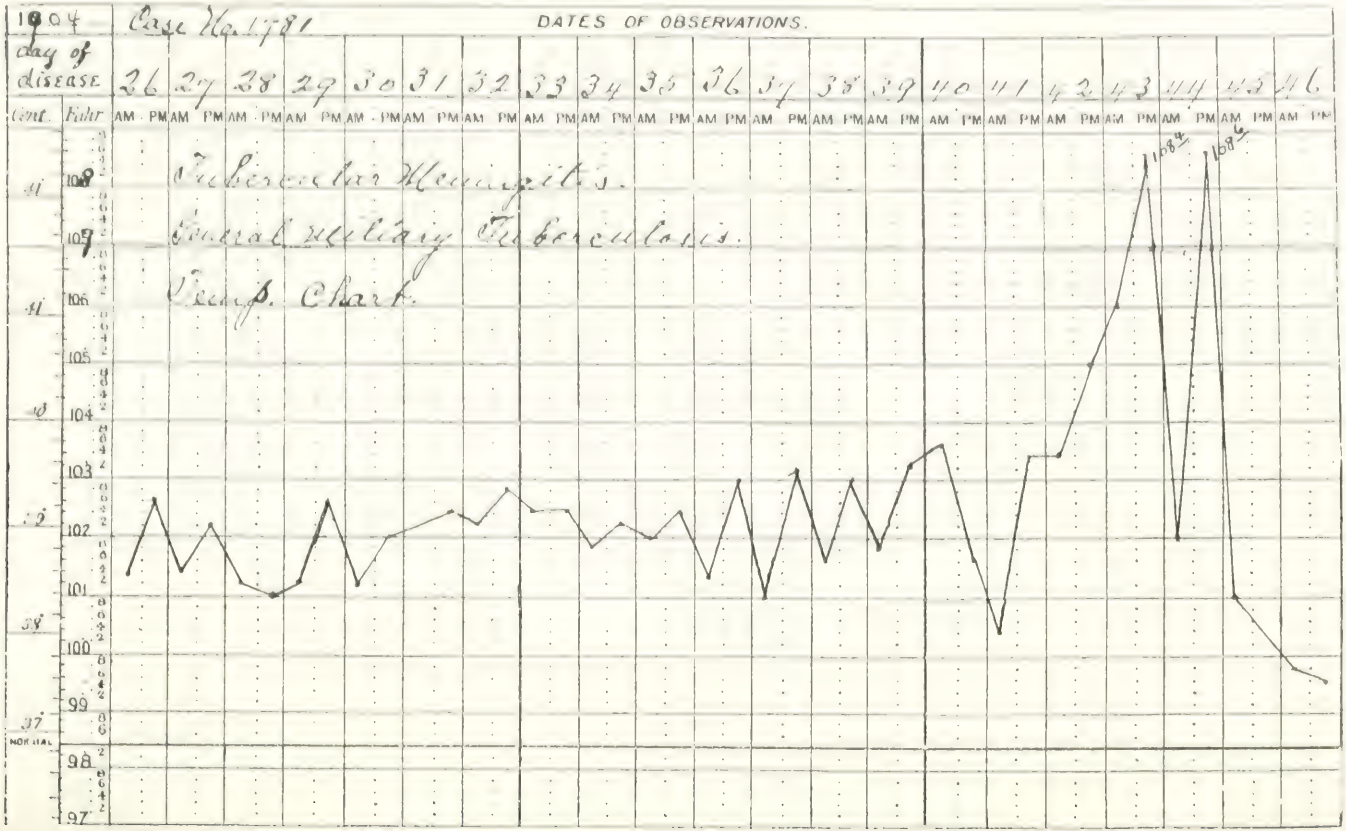

1904
Case No. 1781
DATES OF OBSERVATIONS.
day of disease
26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
Cent. Fahr
AM PM
Tuberculous Meningitis.
Spinal Miliary Tuberculosis.
Temp. Chart.
108
107
106
105
104
103
102
101
100
99
98
97
41°
40°
39°
38°
37°
NORMAL
108.4
108.2

FIG. 3.

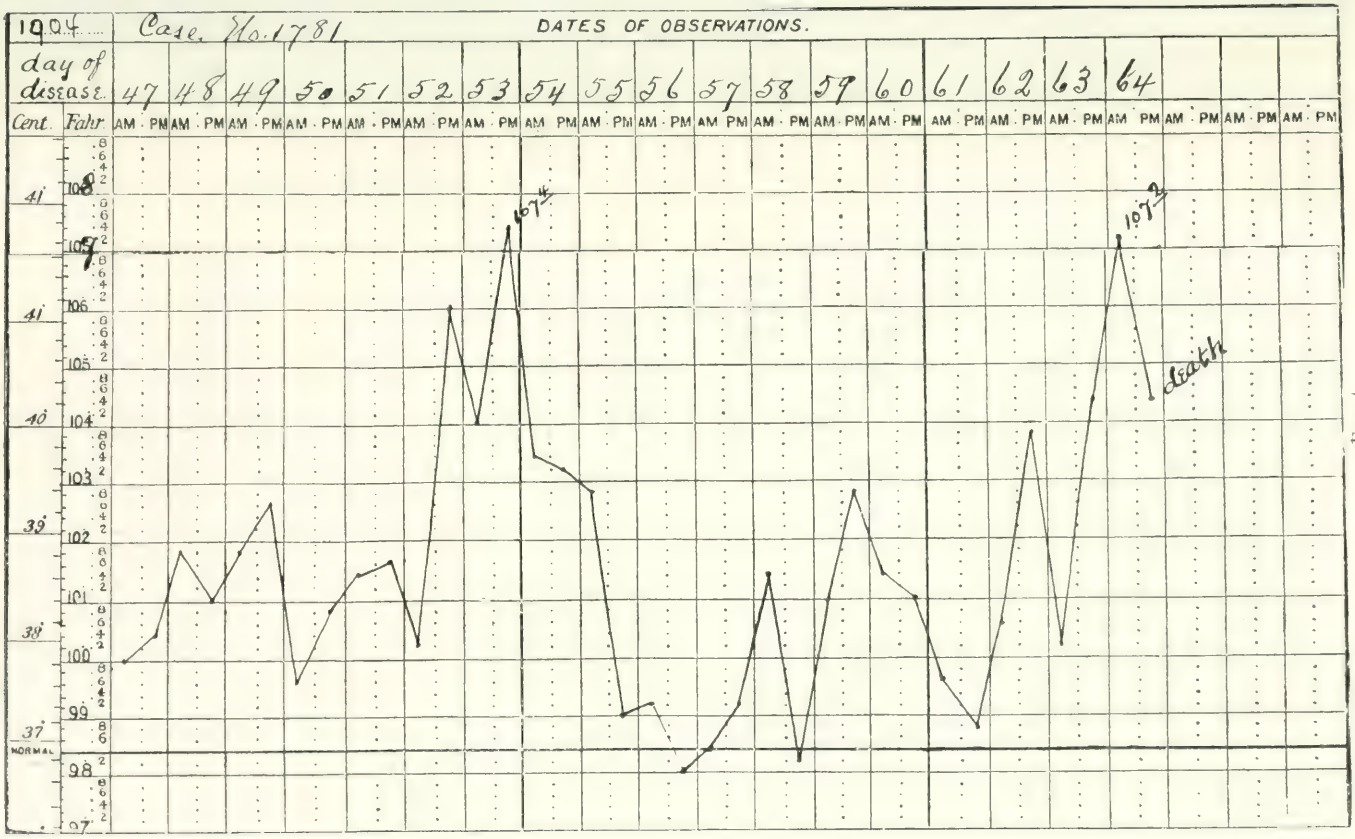

1904
Case. No. 1781
DATES OF OBSERVATIONS.
day of disease
47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
Cent. Fahr
AM PM
41°
40°
39°
38°
37°
NORMAL
108
107
106
105
104
103
102
101
100
99
98
97
107 4/5
107 3/5
death

Fig. 4.

Aside from the regular routine work done in the pathological laboratory during the past year there has been some especial investigation done in the study of pathological as well as normal gall bladders, both infantile and adult, with a view of establishing or disproving the existence of glandular structures in the muscularis beneath the epithelial lining of this organ. The work of investigation along this line is to be continued on a still further series of cases, and a complete report will appear later when the facts are substantiated by larger statistics than are now at hand.

There has also been considerable experimental work done in determining the therapeutic value of a pancreatic and muscle extract in diabetes, and some work is now being conducted to determine the physiological and chemical action of a new synthetic product, a so-called intestinal antiseptic.

The work in bacteriology, chemical analysis and urinalysis done in the laboratory for the past year is indicated by reference to the following:

Report from January 1st to October 1st.

Smears made for bacteriological examination	416
Cultures made for bacterial growths	184

Culture media prepared in our own laboratory for bacteriological purposes as follows:

- Plain bouillon
- Agar agar
- Gelatine
- Litmus milk
- Glucose agar
- Glycerine agar
- Blood agar
- Ascites fluid
- Ascites bouillon
- Blood serum.

Blood examinations:

Report February 1st to October 1st

Leucocyte counts	1333
Red cell counts	319
Differential counts	50
Haemoglobin determinations	325

Widal tests 85
Blood cultures 31
Stomach contents examined 45
Faeces 94
Sputum 273

Urinalysis—

Single specimens 2417
24-hour specimens 844
Quantitative sugar 200
Quantitative chloride 30
Quantitative albumen
Determination is made in all specimens showing an albumen reaction.
Milk examinations 12

REPORT OF CASE IN SERVICE

OF

HENRY B. FAVILL, M. D.

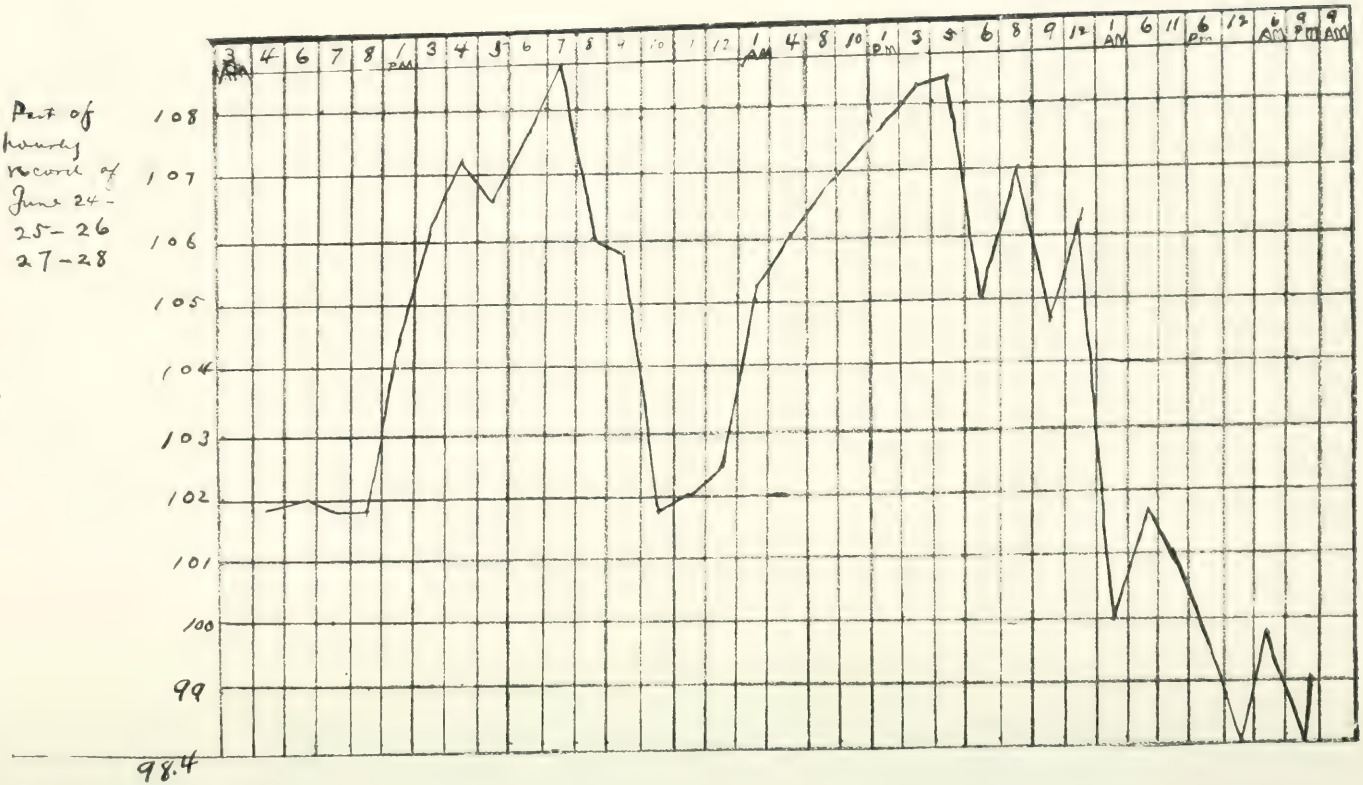
Child twelve months old, having general rickets and general tuberculosis, intercurrent tubercular meningitis, temperature reaching 108.6°, child surviving for three weeks thereafter.

I am lead to report this case for the following reasons:

First, because of the widespread tubercular disease, particularly in the lungs, without sufficient physical signs for clear diagnosis.

Second, because of the extremely high temperature, from which the child materially improved and lived for twenty-one days.

The child was brought into the hospital on the 13th day of May, 1904, in the following condition: Richitic changes of the bones of the skull, humeri, radii, tibiæ, and ribs. Bulging of the fontanelles which were wide open, softening of the occipital bone and protuberance of the abdomen. The diagnosis at that time was doubtful. The temperature was practically normal, but respiration high. On the fifth day after admission the child began to have an even temperature, which continued at not higher than 102° for a few days and then receded. Then followed a period of almost normal temperature, with occasionally a day of high temperature, 104°. Then followed a period of several days in which the temperature was uniformly between 101° and 102°. During all of this time the child did not cough much and did not seem very ill. There was, however, an area of dullness in the lower


Part of hourly record of June 24-25-26 27-28
108
107
106
105
104
103
102
101
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99
98.4
3 PM 4 6 7 8 1 PM 3 4 5 6 7 8 9 10 12 1 AM 4 8 10 1 PM 3 5 6 8 9 12 1 AM 6 11 6 PM 12 6 AM 9 PM 9 AM

right lung. It began to be evident that the child was probably tubercular, although it would be an extreme statement to say that it had broncho-pneumonia. Losing weight rapidly, the abdominal walls becoming so thin as to show clearly all intestinal movements. The temperature gradually rising on the average until on the 16th of June it reaches 103°. June 17th, stupid, fontanelles bulging strongly and head retracted. June 20th, temperature reaches 104°, condition generally aggravated. June 23d, temperature 105°, marked spasticity and reflexes much exaggerated. Babinsky reflex wanting, but on the left side an Oppenheim reaction. Left pupil is larger than the right. Respiration is grunting and in series with short intermissions between. Not typical Cheyne-Stokes. Breathing over the chest harsh but no consolidated areas. June 24th, conditions much the same, temperature rising and remaining high during the day, 108.4° being the highest. June 25th, temperature lower, 100°. Less pressure in fontanelle, pupils, normal, pulse good, respiration slower. Spasticity less. In the afternoon, however, temperature rises again, reaching at 7 p. m. 108.6°.

Gradually temperature falls, the pulse becomes lower and more regular and the respiration as well. For a period the child goes on apparently much improved, except stuporous. July 3d, temperature rises again to 106°. July 4th, 107.2°, after which the temperature runs scarcely above normal until just before death, which occurred on the 14th of July.

Postmortem made by Dr. Wells; following anatomic findings: First, milliary tuberculosis of both lungs, liver, diaphragm and peritoneum. Second, tubercular broncho pneumonia, right middle lobe. Third, tubercular basilar meningitis. Four, nodular tuberculosis of brain, left occipital lobe. Five, thrombosis of superior longitudinal and lateral sinuses. Sixth, white thrombosis of right auricular appendage. Seven, milliary tubercular pericarditis. Eight, generalized tubercular lymph adenitis, especially

mediastinal. Nine, internal hydrocephalus. Ten, hyperplasia and ulceration of Peyer's patches and solitary follicles. Eleven, tubercular caries of dorsal vertebræ. Twelve, rachitic osteochondritis. Thirteen, patent anterior fontanelle.

As will be seen the degree of involvement in the tubercular process was extreme. The child diminished in weight from 21 pounds to 13 pounds. The point of especial interest, however, is the extremely high temperature on two successive days and more remarkable still a recession of temperature and symptoms with a period of apparent improvement and the continuance of life for three weeks.

This serves to throw a certain light upon the more or less moot question as to the limits of temperature in clinical experience compatible with continued life.

SEVERE HEMORRHAGE FROM THE STOMACH OCCURRING DURING TYPHOID FEVER RECOVERY.

EDWARD B. HUTCHINSON, M. D.

The interest in this case centers in the rarity with which cases of ulceration and subsequent hemorrhage from the stomach, occur during the course of a typhoid infection. In this case, since recovery followed, the exact pathologic condition could not be determined. For the following reasons, however, it seems probable that the ulcerations were due to the specific infection and not to an old unhealed peptic ulcer. The patient's previous health had always been good with the exception of a single attack of lead colic seven years previous. Further, the time at which the hemorrhage occurred preceding and following hemorrhages from the bowel; and finally the absence of pain or tenderness at any time over the epigastrium.

From the records of the older pathologists we learn that in autopsies held on patients dying of typhoid fever, they noted the occurrence of detachment and punctuate redness of the gastric mucous membrane, at times of small areas of erosion. Louis claims that these ulcers represent nothing specific. Mitchell reports one case of ulcer of the stomach and refers to several others occurring during typhoid, in none of which were typhoid bacilli isolated from cultures. Small round ulcers found in the œsophagus are described by Jenner. Curschmann believes that rarely ulcers may occur in the stomach wall. The attempts of Cornil and Chauffard to establish a peculiar typhoid affection of the stomach in the form of focal accumulation of lymphatic elements in the mucous membrane

requires further demonstration. Osler says he has found a few cases of recent ulcer of the stomach among his autopsies on typhoid patients.

Oscar E. ———, painter, 45; Finn; widower.

Normal weight, 160 pounds; entered St. Luke's Hospital, May 22, 1904.

Family History: Wife died of typhoid fever May 10, 1904; otherwise negative.

Previous History: Always been well. Had a slight attack of lead colic seven years ago.

Present trouble began two weeks previous to admission to hospital with malaise, headache and backache, but continued at work until two days ago, when he was compelled to give up and take to his bed on account of weakness and exhaustion. Slight cough, no expectoration. No chills; bowels sluggish.

Physical Examination: Development good, nutrition good. Strength fair, expression apathetic. Eyes clear; lips moist and red; teeth good; gums an occasional blue area; tongue white coating.

Systemic. 1. Circulatory, heart normal position and outline; no murmur. Sounds feeble, vessels elastic. Pulse, soft, full, compressible.

2. Respiratory. Inspection, palpation, percussion, auscultation, are negative.

3. Digestive. Abdomen; no liver or spleen can be felt; no tumor mass of any kind to be felt in abdominal cavity.

4. Glandular

5. Osseous

6. Muscular

Negative.

Skin clean, dry. In mid axillary line of left side several small rose-colored papules which disappear on pressure.

Urinalysis. Amber, acid, cloudy; sp. gr. 1020; trace of albumen; no sugar; urea 3 5-10 per cent; no pus; few large granular casts.

Widal examination, positive. Time, 60 minutes; dilution, 1-40. Leucocytes, 5500.

May 22d. Upon admission to hospital, temperature 104 deg., pulse 100, respiration 24. For the following eight days an uneventful course of typhoid fever.

June 2d. Temperature normal for first time since entering hospital; spleen palpable; a few fading rose spots on abdomen; pulse soft, full and dicrotic.

June 12th. After a week of normal temperature the temperature for the past three days shows an evening rise of 100-101 deg. On June 15th it was again normal. Right side of chest shows a slight dulness and increased vocal fremitus; expiration is everywhere prolonged; no rales. During past week patient has emaciated rapidly; heart sounds barely audible.

July 1st. For past two weeks temperature has varied from 99 101 in the evening. For the past few days has complained of pain after urination; at times pain extends up over pubes, radiating into inguinal regions. Examination per rectum shows prostate normal, no tenderness in bowel.

July 5th. Examination of blood; reds, 2,240,000; whites, 12,400; hgl., 60 per cent.

Speaks of sharp shooting pains in sacral and left iliac regions after B. M. Tenderness over left iliac crest posteriorly is marked. Herpes over left gluteal region. Temperature has been below 100 deg. for past three days.

July 11th. The pain mentioned has continued intermittently. At 5 P. M. to-day he voided in stool about 18 ounces of blood, partly fresh and partly clotted. Just before the movement he vomited a considerable amount of clotted and fresh blood. For the resulting exhaustion he was given 1000 cc N. S. sol. and kept on rectal feeding. Pain over sacrum has disappeared.

July 12th. Blood examination—reds, 1,500,000; whites, 21,000; hgl., 20 per cent.

July 13th. Blood examination reds, 1,600,000; whites, 19,000; hgl., 25 per cent.

General condition much improved.

July 18th. Profuse bloody emesis, clotted and fresh at 6 A. M. During the day two other attacks. Has lost a large amount of blood.

Blood examination —reds, 900,000; hgl., 15 per cent. His condition was now so alarming that the propriety of surgical relief to control the hemorrhage from the stomach was considered.

Dr. A. E. Halstead, who saw the case in consultation, on account of patient's condition advised against surgical interference. The patient was given N. S. sol., 10 per cent gelatine injections, rectal alimentation and stimulated.

July 20th. During the following three days his condition remained critical, when he gradually began to improve.

August 3d. Blood examination—reds, 2,240,000; whites 7,000; hgl., 40 per cent.

Examination of urine: Clear, acid; 1010 sp. gr., albumen, trace; sugar, none; few pus corpuscles; few granular casts.

Patient has occasional chills not followed by any rise in temperature, nor is there at any time a leucocytosis. Patient is extremely emaciated, has a slight cough, œdema of legs has been present for several days.

August 10th. Physical examination of chest shows a generalized bronchitis. Expectoration is free in amount.

Microscopical examination shows many diplococci but no T. B. The lungs are markedly emphysematous.

August 18th. Severe chill, first since the 10th inst.; no leucocytes.

August 31st. Repeated examinations have at no time shown the malarial plasmodia. Ever since his last chill on the 18th the patient has improved mentally and physically. He eats well; coughs and expectorates a great deal.

Repeated examinations have never shown T. B.'s. Has been sitting up in bed for a short time daily. Physical examination of chest shows no change.

September 17th. Discharged from the hospital. Cough has not entirely disappeared. Appetite good; strength has improved. Walks all around the ward. Physical examination of chest still shows small scattered areas in which rales are at times heard. Blood examination—reds, 2,500,000; whites, 9,000; hgl., 50 per cent.

CLINICAL, PATHOLOGICAL AND BACTERIOLOGICAL REPORT OF CASES OF ACTINOMYCOSIS OF CECUM, LIVER AND LUNGS.

Dr. L. L. McArthur and Dr. J. C. Hollister.

Mrs. R. Married; one child of 18 months.

Had always enjoyed robust health up to the time of marriage. Six months prior to her consultation relative to the appendix she had been under the care of a dentist. An attempt at extraction resulted in fragmentation of the roots. After many weeks of intermittent but abundant discharge of pus the last fragment, consisting of an exostosis at the end of a root, was removed and the wound healed. The question as to there being here a primary actinomycotic infection was not considered or suspected at the time.

It was later ascertained that very frequently, even so much so as to excite rebuke from her husband, the patient would, while in the country or on golf field, place in her mouth bits of straw or shafts of wheat or of grass.

When in the south during the winter preceding her illness she noticed pain in the ilio-cecal region with tenderness and occasional crampy attacks, which were frequently followed by fever. These pains gradually increased in severity until time of her return to the city, when a mass in the ilio-cecal region was discovered by Dr. Frank Cary, the family physician. This mass was sensitive, somewhat movable and presented the characteristics of an ordinary appendiceal abscess, but on operation proved to be a tumor of the ilio-cecal region.

Entered St. Luke's Hospital November 2, 1903. Temperature 99. White blood count, 11,000. Urine, few casts, granular.

Operation (November 4, 1903). Muscle splitting incision over tumor mass. Thickened omentum lifted from caput coli. Ileo-cecal mass freed by blunt dissection. A drop of pus was seen to escape from behind head of cecum where it had been in contact with the int. iliac muscle. Right tube freed from mass and dropped back into pelvis. Clamp at point three inches back on ileum, five inches up on colon. Intervening bowel resected. End of colon closed. End to side anastomosis of ileum to hepatic flexure of colon by Murphy button. Diseased end of omentum which covered diseased bowel ligated and removed.

Clinical Diagnosis at Operation: Hyperplastic tuberculosis of ilio-cecal region with inclosed abscess possibly about appendix.

In the laboratory examination of specimen removed no evidence of tuberculosis or carcinoma could be found. There were no tubercle bacilli, no giant cells, no masses of epithelial cells. The question of the mass being the result of actinomycotic infection was not at this time considered.

Course While in Hospital After Operation: Good condition after anæsthetic. Murphy button passed on tenth day. Discharge of pus from "stitch abscess" on twelfth day which drained thoroughly and was healed on the twentieth day.

Discharged on the twenty-fifth day seemingly in excellent condition.

History Before Entering Hospital the Second Time: For three or four weeks patient steadily gained in weight and strength. About the first of March she reported by telephone some colicky attacks of pain in right side of abdomen attended by considerable gas in the bowels and some fever. Relief obtained from cathartics. Ten or twelve days later she suffered similar attacks and then one

afternoon after a violent attack of coughing she expectorated a considerable amount of muco-pus.

Examination by Dr. Hollister two days later revealed frequent attacks of coughing with abundant expectoration of serous fluid containing pus; temperature ranging from 102 to 105; area size of silver dollar inner border of right scapula behind, with impaired resonance and roughened breath sounds and occasional moist rales.

No abdominal findings at this time.

In spite of the fact that no tubercle bacilli could be found after repeated examinations of sputum, patient was placed on tubercular treatment of outdoor living and forced feeding. The real kind of infection was not as yet suspected although typical actinomycotic granules were found later in the sputum. The lung findings gradually cleared up, but high temperature with occasional chill and marked cough and expectoration persisted.

Examination about ten days later by Dr. McArthur revealed slight enlargement of right lobe of the liver, with undoubted tenderness persistent in one spot corresponding nearly to gall bladder area. This finding combined with the clinical history led to the diagnosis of hepatic abscess with probable perforation of diaphragm into bronchus. (Verified later.)

Operation for relief of liver abscess strongly advised.

Consent was finally given and patient entered hospital March 9, 1904. Temperature, 97.5. Pulse, 112. Respiration, 20. Taken at once to operating room.

Operation: Aspirating needle inserted into painful area above gall bladder gave no result.

Incision 3½ inches long along external border of right rectus. Upon retracting inwards fibers of rectus, and before cutting posterior sheath, an ounce or two of pus escaped through a perforation in the sheath.

Drainage tubes. Fair condition.

Subsequent History: But little drainage after first twelve hours. Coughing persistent. Temperature re

mained high, 100° to 104° and 105°. Had a chill on third day. Subnormal temperature followed by chill and high fever (103° or 104°) daily for six days and irregularly afterwards, the blood count running irregularly from 7,000 to 18,000.

Stitches were removed under anæsthetic twelve days after operation. Cavity explored and larger tube inserted but this was not followed by free discharge.

General condition constantly grew worse, the pulse running up. There were occasional chills and sinking attacks with frequent profuse diaphoresis until patient died thirteenth day after operation.

Autopsy—3-24, 1904. Dr. H. G. Wells:

Multiple actinomycotic hepatic abscesses; multiple miliary actinomycotic pulmonary abscesses; acute fibrinous pleuritis; adhesive fibrous peritis at base of right lung; fibrous perihepatitis; fibrous cholecystitis; unhealed laparotomy wound in right hypochondrium; absence of cecum and appendix; chronic parenchymatous nephritis; hyperplasia of the spleen; pulmonary œdema; varicose veins in pampiniform plexus; cachexia; nephroptosis.

External Appearances. The body is somewhat emaciated, 157 cm in height, with marks of embalming in the abdomen and axilla. The body is not cold, and rigor mortis is complete. Areola of the breast pigmented; linea albicantes in abdomen. Slight œdema of the feet. Beneath the right costal arch is an incision 9 cm long, 4 cm of which is open, and bordered by granulation tissue. From this incision pus exudes. There is a pigmented mole on the outer side of the left thigh.

Abdominal Cavity. The omentum contains a little fat and is adherent to the parietal peritoneum. The abdominal cavity is full of embalming fluid. The mesocolon and liver are adherent to the parietal peritoneum above the opening of the incision. On separating these adhesions, pus exudes to the amount of 3-4 cc. There are no adhesions among the small intestines, nor in the pelvic cavity.

The veins in the left broad ligament are enlarged, some being 1 cm in diameter. The mesenteric lymph glands are not enlarged nor are the retroperitoneal lymph glands. The left kidney reaches the lower margin of the 4th lumbar vertebra, and the right kidney to the lower border of the 3d lumbar vertebra. The spleen protudes 5.5 cm below the costal arch, and the margin of the liver is 7 cm below the costal arch. The structures in the vicinity of the wound are embedded in a mass of thick peritoneal and omental tissues. This involves all the colon below the transverse colon. The ileum enters the colon 17 cm above its lowest end. There is no thickening at the point of junction. At the closed end of the colon portions of silk ligature are found. There is no thickening at this point. All this part of the colon is embedded in dense adhesions. The pylorus is also adherent in the vicinity of the gall-bladder. There are many fibrous adhesions between the liver and diaphragm. The diaphragm reaches the fifth rib on the right and the sixth on the left side.

Heart is normal in size, weighing 8 oz., and presents no changes.

Lungs show slight adhesions about the right apex, and the right lung is firmly adherent to the diaphragm and much thickened and roughened at this point, corresponding to the adhesions between the diaphragm and liver. The posterior surface of the lung is covered with a fibrinous exudate and throughout small areas of consolidation can be felt. At the point of adhesion to the diaphragm is an extensive solid white area extending 3 cm into the lung. This lung contains much fluid. The left lung shows a scar on the apex, and scattered throughout can be felt numerous shot-like nodules, some of which are visible in the pleura. Near the apex of the lower lobe is a small patch of fibrinous exudate. On section these nodules contain pus, and there are small miliary abscesses throughout the lung substance. This lung contains a moderate amount of fluid.

Liver weighs 3-8 oz. (1680 grams). There are dense fibrous adhesions in the vicinity of the gall-bladder. The glands in the hilum of the liver are not greatly enlarged, but are pale in color. The portal vein shows no thrombosis. The fundus of the gall-bladder is obliterated by dense scar tissue. The cavity is very small throughout with much thickened walls. On the outer edges of the liver, on either side of the gall-bladder are fluctuating areas 3x4 cm in diameter over which the adhesions are the thickest. On the posterior lateral surface of the right lobe a number of fluctuating yellow areas protrude. Another large fluctuating area is in contact with the diaphragm in the line of the coronary ligament and is surrounded by dense fibrous tissue. This lies immediately beneath the solid area in the lung. On cutting the right lobe, these soft areas are found to correspond to well circumscribed areas which appear to contain necrotic tissue. These have a mesh-like structure, containing a quantity of yellow-green pus. The largest area, 5x4 cm, is under the diaphragm. The tissue surrounding these areas is dark red for some distance. The abscesses in the side and upper part communicate but are independent of those in the lower part. The smallest areas are about 1 cm in diameter and the total number is about 12. No such areas are found in the left lobe and the remaining liver tissue appears a little firmer than normal, with the lobular markings indistinct. No communication can be found between the abscesses in the liver and the pus found in the adhesions beneath the laparotomy wound.

Spleen. Weight, 500 grams. Symmetrically enlarged throughout, measuring 19x9x5 cm. Color normal and consistence moderately firm. The cut surface is uniform, and not pulpy. The Malpighian bodies are widely separated and not enlarged. There are no areas of softening nor hardening in this organ.

Adrenals are normal in size and appearance.

Kidneys together weigh 420 grams. They are both much

enlarged, measuring 13.35 cm in length. The consistence is firmer than normal. The cortex and medul'a are pale and similar in color. The cortex measures 7 mm. The capsule strips easily, leaving a smooth surface. The Malpighian bodies are indistinct. There are no changes in the vicinity of either kidney.

Pancreas weighs 1 oz. and is of normal size and appearance.

Gastro-intestinal Tract. No changes in the stomach. On the mucous membrane at the point of closure of the colon a silk suture is found. There are no accumulations nor thickenings of the mucosa at this point. At the point of anastomotic union between the small intestine and the colon is only a fine red line, without thickening or contraction, otherwise the intestines are free from changes.

Urinary Tract. The urinary bladder is unchanged.

Generative Tract. The uterus is normal, showing an old transverse cervical laceration, slightly eroded. The ovaries are very large, the right measuring 45x19x17 mm, and the left being 40 mm in length. An old corpus luteum is seen on section and scars of healed bodies.

Lymph Glands in general are normal.

Diaphragm is thickened slightly at the point of the abscess in the liver in contact with it, but there is no evidence of perforation at this point.

PATHOLOGICAL REPORT.

Lung (L). Indurated area at base of right lung. The alveolar spaces are compressed and obliterated by dense bands of fibrous connective tissue. The alveolar epithelium in these areas has become cuboidal and the alveolar spaces tubular in appearance. These spaces are often filled with large desquamated epithelial cells, containing pigment. Throughout the section there are areas of round cell infiltration and a more degenerated condition of leucocytic infiltration. The pleura is much thickened, showing round cell infiltration, granulation tissue and the older

layers of fibrous connective tissue. At one point the pelura is adherent to the diaphragm, the musculature of which is also somewhat broken up by the growth of connective tissue.

(II). Lung containing miliary abscesses. The air cells are partially filled with a coagulated inflammatory exudate containing fibrin, desquamated epithelial cells and polymorphonuclear leucocytes. The alveolar walls are somewhat thickened and throughout the section are bands of connective tissue showing an active stage of round cell infiltration. An infected thrombus is seen in one of the large vessels, consisting of a mass of fibrin in one part of which is a mass of leucocytes and cellular detritus. The walls of this vessel are thickened and connective tissue bands radiate from it through the lung substance. The bronchi are filled with the inflammatory exudate and the epithelium is desquamating. The pleura shows some round cell infiltration with granulation tissue and fibrous tissue formation. Two actinomycotic areas are seen, one in which there are three foci of fungus growth, surrounded by a wide area of leucocytic infiltration and a definite connective tissue capsule. Compare with Fig. I. A similar area in the immediate vicinity has fallen away carrying out the surrounding leucocytes, leaving a vessel like wall of connective tissue.

Liver (I) Abscess. The normal liver tissue is obliterated by varying conditions of connective tissue proliferation and areas of degeneration. Tangled masses of threads, stained deeply blue and arranged in radiate figures of varying sizes, form the centers of areas of polymorphonuclear leucocytic infiltration. See Figs. II, III and IV. The meshes of these masses are filled with a red, hyaline appearing substance in which are many bright red and blue granular bodies. These fungus centers vary greatly in size, from small microscopic areas to those plainly seen with the naked eye. They have a tendency to break free from the surrounding tissue and in some

places have fallen away. Dense leucocytic masses are also seen without the central fungus mass. These are surrounded by round cells and loose fibrous tissue containing plasma cells.

(II). Tissue remote from abscesses. The cords of liver cells are widely separated and broken up. The nuclei are pale and the protoplasm granular. There is some fatty degeneration in the centers of the lobules. Small areas of round cell infiltration appear in the portal canals.

Kidney. There is some glomerular degeneration and a granular exudate into the glomerular spaces. The epithelium of the convuluted tubules is swollen and broken up. The nuclei are pale and reticular. The lumena contain some granular fluid. The tubules are dilated. There is no congestion and no interstitial change.

Pancreas negative.

Adrenal normal.

Spleen. The Malpighian bodies are pale, and widely separated. There is no great increase in trabecular and connective tissue. There is much congestion.

Fallopian Tube normal.

DR. W. M. HARTMAN, ST. LUKE'S HOSPITAL.

The tissue removed at the first operation was examined and found to consist of a dense mass of fibrous tissue matting together the caecum, colon and about 6 inches of the ileum. In no place was the lumen of the bowel closed, and the mucosa appeared normal throughout. Upon histological examination a normal mucosa was found with a submucosa much thickened with fibrous tissue. There was an enormous hyperplasia of connective tissue containing numbers of lymph follicles and blood vessels. On the posterior surface of the caecum near the base of the appendix, areas were found composed of polymorphonuclear leucocytes. They resembled the actinomycotic areas in the liver and lung, Figs. I, II, III and IV, but the fungus

masses were absent. Tubercle bacilli and giant cells were not found. Fungus threads could not be found in sections stained by Gram's method.

The organism found in these lesions presents the following morphological characters. The granules found in the sputum and pus varied in size from a pin head dot to minute dots, seen only by spreading the pus in a thin layer on a piece of glass and viewing against a dark background. They were gravish and light yellow in color,

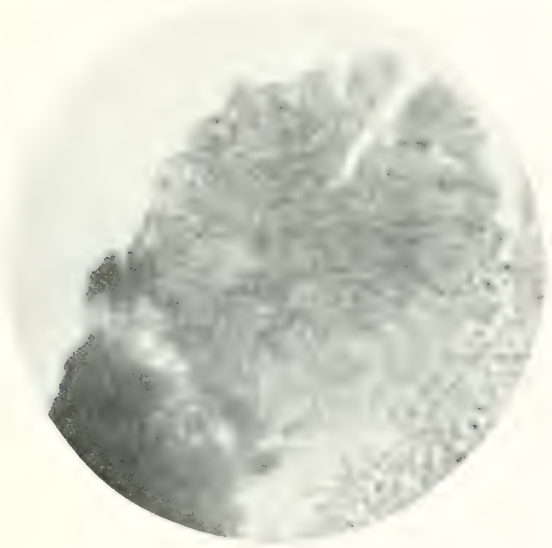

FIG. I.
Ray Fungus in Milliary Abscess in Lung. X150

oval in shape and quite soft in consistency. When examined unstained in salt solution or glycerine with the low power, they revealed a central mass with a coarse granular structure from the margin of which projected a network of straight and curved, refractile threads. Oval, hyaline masses in no way connected with the threads were visible but clubs could not be seen. The organism stained quite readily with the ordinary aniline dyes, with a some-

what slighter affinity for methylene blue. With the method of Ziehl Nielson for the tubercle bacillus it remained unstained. It stained best by Gram's method which colors the slender filaments a deep violet. Coccus and bacillus-like forms were common. In the center of the granules coccus bodies were most common. Here and there small bodies in the threads retained the stain and gave them a granular appearance. Stained by the method of Abbott for spores these bodies remained uncolored.

Fig. II.
The Fungus in Liver Tissue.

The long threads were very easily broken into shorter bacillus-like bodies. Branching which is dichotomous was uncommon in the granules and in the cultures. Clubs could not be demonstrated by the method of Mallory. Bulbous extremities on some of the threads were noticed in some of the granules and were especially marked in the agar cultures. But they stained uniformly with Gram's method and did not show a hyaline unstained

border as typical clubs should. In the culture the threads are thicker than in the tissues.

The granules obtained at the time of the operation were washed in sterile bouillon and transplanted to agar, blood serum and bouillon. Four pure cultures were obtained. The granules from the sputum were repeatedly washed in bouillon before transplanting but pure cultures could not be obtained.

After seven days in the incubator an increase in the

Fig. III
Same as Fig. II., but (X650).

size of the granules was noted on the agar. Their out line was irregular, small processes projecting into the media. At the end of fourteen days the granules were about twice their original size. Little growth took place thereafter. The growth extended into the media and did not spread over its surface. At first of a grayish color, they became later a decided yellow.

Bouillon remained clear. At the end of five days small

particles began to collect at the bottom of the tube. As they increased in number a light sediment formed on the side of the tube. The maximum of growth was reached in about fourteen days when the bottom of the tube was covered with yellowish granules.

Bouillon containing 1% glucose gave the best growth.

The growth on blood serum was similar to that on agar.

Sub-cultures on agar gave a very faint growth. The addition of 3% glycerine did not enhance the growth.

FIG. IV.
Actinomycoses of Liver Threads more distinctly (X650).

Blood agar gave no growth.

Potato and gelatine gave no growth in the presence or absence of oxygen. No growth was obtained at room temperature.

A tube of litmus milk inoculated in the first generation was decolorized in ten days. Smears showed the presence of the threads. Tubes inoculated with second and third

generation of the growth from bouillon gave no growth in milk.

The organism grows best in the absence of oxygen. It resists cultivation on ordinary media, glucose bouillon appearing to be the best media for its growth. With the third and fourth transplantation in the latter its growth is very faint. With the third transplantation no growth is obtained. The reaction of all media was 1% acid to phenol-phthalein.

In the early cultures long threads with bacillus and coccus-like forms were found. In the old cultures no threads were present. Only a few bacillus-like forms surrounded by many granular and coccus-like bodies were seen.

Animals were not inoculated.

Attempts to grow the third generation of the organism in neutral and 1% alkaline glucose bouillon and in ascites bouillon failed.

EXTIRPATION OF THE GASSERIAN GANGLION AS A MEANS OF TREATMENT OF FACIAL NEURALGIA WITH A REPORT OF SEVEN CASES.

ALBERT E. HALSTEAD, M.D.

During the last decade the treatment of inveterate facial neuralgia has progressed mostly along surgical lines. The remedies employed in the medical treatment are about the same as before the disease came within the domain of the surgeon. The hypodermic injection of large and increasing doses of strychnine and the internal administration of castor oil are still largely relied upon by the internalists. In a certain percentage of the milder cases and in a few of the more advanced these remedies will give relief. Their value, however, is uncertain in any case and the relief afforded but temporary. In the less severe surgical procedures, viz., neurotomy, neurectomy and avulsion of the peripheral branches of the fifth nerve, little if any advance in the technique can be recorded. The status of these operations remains as before, limiting their application to cases where medical treatment has failed and where the disease involves only one or at most two of the nerve divisions. Even in these we can not insure the patient more than a short period of relief, varying from a few weeks to at most a few months. In a few the disease is self-limited, recoveries being recorded even in the most severe types after years of suffering. The hope of securing anything but temporary relief from the peripheral operations is but slight if we accept Thiersch's statement that if less than 5 cm is removed, rapid regen-

eration of the nerve follows with return of the pain. That even a much larger defect may be completely and quickly restored is evidenced by the case reported by Garré, where after resection of the entire mandibular division of the fifth by Madelung, function was completely restored and pain returned in eight months.

The injection of osmic acid into the peripheral branches of the nerve, either directly through the overlying tissue or after exposing the nerve by incision, first proposed and practiced by Neuber and lately revived and extolled by Murphy, has its physiologic counterpart in neurotomy. Probably regeneration is somewhat longer delayed after its use than after simple section of the nerve owing to its property of hardening nerve tissue; but in the end regeneration with return of function undoubtedly occurs. In the cases reported by Murphy sufficient time has not elapsed to permit any opinion as to the permanency of the cures.

In cases where the peripheral operations have been tried and where medical treatment has failed to benefit, we are fully justified in giving the patient an opportunity of securing permanent relief by removal of the Gasserian ganglion. In other cases where from the first the disease has been of the most severe type, particularly if all three divisions are involved, we can with propriety suggest removal of the ganglion as a primary operation. The magnitude of this operation is such that we believe it should only be attempted where there is no other hope of securing relief from what is probably the most terrible disease that afflicts mankind.

In further justification of this operation the pathology of trifacial neuralgia seems to point to the ganglion as the seat of the disease. Sanger of Hamburg, one of the earliest investigators in this line, found in the ganglia removed by Krause marked changes of a degenerative character. In the first ganglion removed he found the ganglion cells reduced in number, shrunken, and irregular in

shape, with the nuclei indistinct or absent. There was also an increase in the interstitial connective tissue. In the second practically the same changes with pigmentation of the remaining ganglion-cells was found. Conditions similar to these have been found by Horsley, Putnam, Rose and D'Antona. Podrasky, Lavaran, Allen and Romberg found chiefly a condition of sclerosis of the ganglion.

Schwab collected twenty cases from literature in which the ganglion was examined after removal, and reports upon two examined by himself, in one of which the peripheral branches had been resected ten years before. In the latter most marked changes had taken place. In the others nothing pointing to a definite permanent change for the normal could be found. Unequal staining of the cells with slight irregularities in shape and atrophy were the most significant findings. He concludes that trifacial neuralgia has probably no definite anatomical characteristics, and that it is a neuritis beginning in the terminal branches of the nerve with a tendency to ascend, and ending in a chronic interstitial inflammation of the ganglion. He believes, however, that wherever the disease process is located relief must come from removal of the ganglion.

Keen and Spiller described changes found in six of their seven cases which they consider conclusive in character. In the ganglion the medullary sheaths and axis cylinders were much swollen and the fibers atrophied. Most of the sheaths were empty. In some the nerve elements had been destroyed, the axis cylinders being replaced by connective tissue. The ganglion-cells were atrophied, pigmented, and stained faintly. The blood-vessels were narrowed, in some the lumen being completely obliterated. Barker had found variation in the shape and size of the ganglion-cells with fragmentation and pigmentation. Coenen examined the ganglion in fifteen cases for Lexer. He lays stress upon the importance of distinguishing between the findings in cases where former peripheral oper-

ations had been made and those where extirpation of the ganglion was the primary operation. In the first the changes found in the ganglion are probably the result of degeneration following section of the nerve trunk and are analogous to those found in the spinal ganglia after amputation of an extremity. In cases where no peripheral operation had been performed he found nothing that would justify the assumption that the disease process was confined to the ganglion. In the cases previously operated upon the changes found were principally swelling of some of the ganglion-cells with vacuolization, atrophy and pigmentation. Other investigators have detected changes in the nerve trunks in cases of long standing neuralgia. Duplay found in one case numerous small neuromata along the nerve trunks. These he thought bore a casual relation to the neuralgia. Wagner, Carnochan and Allen saw evidences of the inflammatory condition of the neurilemma. In Krause's cases examination of the nerve trunks removed with the ganglia did not show any pathologic change.

Although at the present time it is impossible to state positively that the changes found in the ganglion explain the origin of the neuralgia, still it is of no great moment whether the cause of the pain exists in the peripheral nerve or in the ganglion. The essential feature of the cure is to separate completely the cerebral sensory center from the paths of distribution of sensation. This can only be accomplished either by dividing the sensory root or by the removal of the ganglion.

In proposing the extirpation of the ganglion for the relief of a disease that never proves fatal, we are often deterred by the great risks of the operation and the high mortality that still follows its removal. Unfortunately later fate reports do not show any great improvement in this respect. The earlier statistics show fully as good, and in some cases a larger percentage of recoveries than the later. This is undoubtedly due to the fact that more

unsuccessful cases are reported as the operation becomes better recognized and more generally accepted by the profession. Marchant and Herbert, in 1897, collected 95 cases, of which 66 were operated upon by the temporal route with a mortality of about 12%. In all of these cases the ganglion was not extirpated, so that these figures are not conclusive. Tiffany collected 108 cases with a mortality of 22%. Carson's 100 cases, none included in Tiffany's collection, show 11% mortality. In Murphy's collection of 142 cases, published in 1902, 100 of Carson's and 42 collected by himself, the mortality was 15%. However, in his own personal cases, 12 in number, he had four deaths, a mortality of 33 1-3%.

The removal of the Gasserian ganglion is always a most difficult procedure, and in the hands of the most skillful fraught with great danger to the patient. A record of each operator's successes and failures with a critical discussion of the methods employed will serve to more definitely determine the status of this most difficult, and, when followed by success, most gratifying operation.

Since 1896 we have operated upon seven cases. In all we believe the ganglion was completely removed. Of these seven cases, the first was reported by us in the Chicago Medical Recorder in 1897. This case, with the following two, were included in Carson's collection. The fourth, fifth and sixth were included in Murphy's collection. The last is here reported for the first time.

Case I. Mrs. S., widow, aged sixty-seven. Nativity German. Referred to me by Dr. W. L. Baum, of Chicago.

Family history. Negative; both parents lived to be over seventy years of age.

Past illness. Had typhoid fever twenty years ago; had severe attack of malaria fifteen years ago.

Present illness began suddenly ten years ago with sharp stinging pain in the left side of the face. The first attack came on while washing the face in cold water, the pain

being limited to the left infraorbital region and teeth of the upper jaw. The paroxysms came at first about once a week but gradually increased in frequency and duration until the pain became nearly constant. During the last three years the paroxysms have recurred at intervals of about an hour each, lasting for several minutes. During the first two or three years the pain was referred to the region supplied by the superior maxillary division alone; since then all three divisions have been affected.

Examination shows a well nourished, rugged woman. Heart, lungs and abdomen negative. Left side of the face slightly smaller than the right. While talking will suddenly be seized with a paroxysm of pain which is referred to the whole left side of the face and left side of the tongue. During an attack there is spasm of the facial muscles on the left side, associated with a profuse secretion of tears, nasal mucus and saliva. There is also an apparent spasm of the muscles of the tongue, which prevents her from speaking while the pain lasts. The patient states that she has taken medicine nearly constantly for the last ten years in her effort to get relief. She has always refused morphine.

The patient was operated upon October 31, 1896, the Hartley-Krause method being employed. No particular difficulty was encountered in performing the operation. Hemorrhage from the middle meningeal was severe, but readily controlled by plugging the foramen spinosum with catgut. Krause's method of exposing and removing the ganglion was followed. The wound was drained with a narrow strip of iodoform gauze, and the osteoplastic flap sutured in place. The patient left the table without any apparent symptoms of shock. The duration of the operation was one hour and forty-five minutes. The gauze drain was removed at the end of 36 hours. As soon as it was withdrawn there occurred a profuse arterial hemorrhage from the opening left for drainage. This continuing, the patient was again anesthetized, the wound

reopened, and the source of the hemorrhage found to be the trunk of the middle meningeal artery. The foramen spinosum was again plugged and the wound closed without drainage. No further complications ensued. The patient was up by the end of a week, and left the hospital November 14, fourteen days after the operation.

From the time of return of consciousness after the operation the patient was absolutely free from pain. The area of anesthesia at the time of leaving the hospital corresponded practically to the region supplied by the fifth nerve. No trophic changes were noted in the skin or cornea. The eye was protected from the time of the operation until leaving the hospital, and daily irrigated with a weak boric acid solution. Immediately after leaving the hospital she complained of deafness in the left ear. Examinations of the organ did not reveal the cause. There was no pain nor any objective evidence of disease.

The patient was last examined in October, 1903, seven years after the operation. At this time she was absolutely free from pain and was in the best of health. The area of anesthesia which at the time of the operation corresponded to the distribution of the left trifacial nerve, had diminished in size until an area a little larger than a silver dollar over the center of the cheek still remained completely anesthetic. In the remaining portions of the previously anesthetic area sensation had been partially restored. There had been no trouble with the eye at any time, hearing in the left ear had not been restored.

Case II. C. B. W. Referred by Dr. A. E. Palmer, of Morris, Ill. Ganglion removed by the Hartley-Krause method. Death on the fifth day after the operation from uremia.

History. Patient, male, aged seventy-one years, had suffered from right-sided facial neuralgia for sixteen years. The first attack came on suddenly after exposure to cold, and lasted for about three days. During this attack the pain was limited to the area supplied by the first

division of the fifth nerve and was most severe in the eye. The second attack came on a year later. The pain has been nearly constant since that time, being referred to the parts supplied by the three divisions of the nerve, and most intense at the point of exit of the infraorbital nerve. About twelve years ago the infraorbital nerve was resected. This gave relief from the pain for about two months. In the following four years five operations were performed on the peripheral branches, the supra and infra orbital being each divided once, and the inferior dental resected three times. After each of these operations the patient, though somewhat relieved, was never entirely free from pain. During the last seven years the paroxysms have recurred about every ten minutes. To secure relief he has for the last five years resorted to large and increasing doses of morphine and whiskey several times daily.

Physical examination shows a well-preserved man for his years. Heart and lungs negative. Examination of the urine shows specific gravity 1.026. No albumin; no sugar; a few granular casts.

Operation on November 29, 1898, under chloroform and morphine anæsthesia. Following the usual preparations the Hartley-Krause incision was made, reflecting an osteoplastic flap after the method of Wolff. The hemorrhage from the soft parts and from the bone was unusually severe. The middle meningeal, which occupied a complete bony channel in the temporal, was broken, and was controlled with difficulty. No trouble was encountered in exposing and freeing the ganglion. The hemorrhage from the base of the skull was not excessive. The ganglion was freed from its attachments to the dura, the second and third divisions of the nerve divided with the scissors, and the ganglion twisted off from the first division and the sensory root. Drainage by means of a gauze strip from the bottom of the wound was secured. The osteoplastic flap was replaced and the wound closed by silk-worm gut sutures.

Following the operation the patient suffered a considerable degree of shock, the pulse reaching 130 before the operation was completed. From this he reacted well and appeared in good condition. During the first thirty-six hours following the operation the pulse and the temperature remained about normal. The mental condition was fairly good. At the end of this time no urine had been voided, but three ounces was secured by catheterization. This contained a large quantity of albumin, numerous hyaline and granular casts, and blood cells. From this time on he passed no more urine, the mind became clouded, the temperature and pulse slowly rose, until death in coma occurred on the fifth day after the operation. Post-mortem examination of the operative field revealed no evidence of meningitis.

Case III. G. B. M., male, aged fifty. Referred by Dr. H. T. Patrick. Operation. Removal of the ganglion by the Hartley-Krause method. Recovery.

History. Family history good. Past history of disease: Had only the usual diseases of childhood. Habits: Used alcohol and tobacco moderately.

Has had a left-sided facial neuralgia for seven years. First attack came on suddenly at night without any known cause. This subsided after two weeks. About three months later he had a second attack, which persisted with slight remissions for seven years. During the last five years the pain has been referred to all of the divisions of the fifth nerve. The paroxysms during the last three years have been coming on about every ten minutes and last from one to three minutes. Patient has tried all kinds of remedies without securing any relief.

Physical examination shows a fairly well-nourished, but aged-appearing man. Heart, lungs and abdomen negative. There is some asymmetry of the face, the left side appearing somewhat smaller than the right. The conjunctiva of the left eye is injected. There is a profuse secretion of mucus from the left nostril and of tears from

the left eye during the paroxysms of pain. The face over the infraorbital region and the left half of the tongue is extremely sensitive to touch and to heat and cold. Each paroxysm of pain is associated with spasm of the orbicularis palpebrarum and to a less degree of the other muscles of the left side of the face. Vision is normal. The special senses are not impaired.

Operation under chloroform and morphine anæsthesia, December 30, 1898. The technic was practically the same as in the preceding cases. The hemorrhage was not troublesome at any time. After the separation of the dura from the middle fossa down to the ganglion, the cavity was packed for about five minutes with gauze saturated with two-per cent solution of gelatin. After the removal of the packing the operative field was practically dry and no further hemorrhage of consequence occurred. The middle menigeal artery was located close to the foramen spinosum. The ganglion was elevated from its bed, freed of the dura, after which the second and third divisions were severed. The ganglion was then twisted free and removed apparently intact. The patient was in good condition during the operation and at all times afterwards. There was no shock.

The following day examination of the face showed complete anæsthesia over the part supplied by the second and third divisions, but only partial anæsthesia over the area of distribution of the first division. The patient was free from pain when discharged from the hospital on January 16, 1899.

Two years after the operation, at my request, he presented himself for examination. At this time he complained of pain, most severe in cold weather, and principally at the point of exit of the infraorbital nerve. Although this pain was not nearly so severe as it was before the operation, yet it caused him considerable anxiety for fear it would increase. Examination of the face showed that there still existed total anæsthesia of the

region supplied by the second and third divisions of the nerve, and that the sensation of pain, and of heat and cold was entirely absent from the parts supplied by the infraorbital nerve. One year later he again consulted me. At that time he still had pain, but it was not so intense as before. The anæsthetic area remained about the same. His general health was better and he appeared more cheerful. Since that time he has not reported his condition.

Case IV. T. J. H., male, aged fifty-three. Referred by Dr. W. L. Baum. Operation: Removal of the Gasserian ganglion by Cushing's modification of the Hartley-Krause method. Recovery.

History. Patient has had in addition to the diseases of childhood smallpox and several attacks of malaria. Has had gonorrhea, but denies syphilitic infection.

The disease for which he now seeks relief began with a sharp, constant pain in the right side of the face eleven years ago. The painful area has gradually extended so that at present it involves the whole lateral half of the face, the frontal and auricular regions, and the tongue, corresponding accurately to the distribution of the right trifacial nerve. There is increased secretion of mucus from the right nostril with injection of the conjunctiva of the right side, and spasm of the right half of the tongue with each paroxysm of pain. The patient suffers continually from pain, which is increased at intervals of about five minutes by sharp twinges referred to the area described.

Habits: Patient uses whiskey and tobacco moderately.

Physical examination shows a well-nourished, healthy-appearing man. Nothing abnormal found in the chest or abdomen. Special senses not disturbed.

Operation November 9, 1900, under chloroform anæsthesia. An horse-shoe shaped skin flap, the convex border of which extended about three centimeters above the zygomatic process, was reflected. The temporal fascia and muscle were incised and reflected exposing the temporal bone over an area corresponding in size to the skin

flap. The zygoma was divided in two places corresponding to the lower limits of the incision and reflected downwards with the flap. A small Trephine opening was made just above the zygoma, slightly anterior to the center of the exposed portion of the skull. This opening was further enlarged by biting away the bone with a Macewen forceps. The middle meningeal was exposed in the posterior portion of the opening in the skull, but was not injured. The dura was readily separated from the base of the skull and the hemorrhage from the veins controlled by packing the cavity with gauze saturated with two-per cent gelatin solution. The ganglion was exposed and removed, the technic followed being that described in the previous cases. Nothing of importance occurred during the operation. The hemorrhage was not troublesome at any stage. At no time was there any serious danger of injuring the middle meningeal artery which was held back out of the way by the retractor used to elevate the brain from the middle fossa. The patient made a rapid recovery after the operation and has had no pain at any time. The anæsthetic area corresponded to the distribution of the fifth nerve. He was discharged from the hospital with the wound healed and free from pain on the 15th of November, six days after the operation. He reported one and a half years later that he was still free from pain, but he had difficulty in opening the mouth, there being partial ankylosis of the temporo-maxillary articulation on the side of the operation. Up to present time he is still free from pain.

Case V. C. E. G., female, aged fifty-seven. Operation: Removal of the Gasserian ganglion for left-sided facial neuralgia by Cushing's method. Recovery.

History. Present trouble began seven years ago with severe pain in the face after exposure to cold. Since that time the pain has been nearly constant. Short intervals of relief have been obtained by section of the supra-orbital and inferior dental branches of the fifth nerve. The last

of these operations, resection of the inferior dental, was performed two years ago. This gave relief for about six weeks. The pain is now referred to the entire side of the face, being most severe at the points of exit of the supra and infraorbital nerves. Medical treatment has been tried, but has given no relief.

Examination shows a poorly nourished woman. The teeth have all been extracted with a view of relieving the pain. There are scars above the orbit and over the body of the inferior maxilla on the left side. The face is slightly asymmetrical, the left side showing atrophy. Examination of the heart, lungs and abdomen negative. The urinary findings are also negative.

Operation March 3, 1901, under chloroform and morphine anaesthesia, Cushing's method being employed. After reflection of the U-shaped flap and division of the zygoma, an opening was made close to the base of the skull with a small trephine. This was enlarged by biting away the bone with a Macewen forceps. No bone flap was preserved. The opening thus made in the skull was smaller than in our previous operations and the distance from the surface to the ganglion was less. No difficulty was experienced in reaching the ganglion nor in exposing and removing it. There was no hemorrhage from the middle meningeal, and but slight oozing from the veins at the base of the skull. A gauze tampon saturated in gelatin solution was employed with success as in the preceding cases. The patient was in good condition during the operation. Recovery was uninterrupted, the wound healing by primary union. There was no pain at any time after the operation. There was unilateral anaesthesia of the face and tongue corresponding to the part supplied by the fifth nerve. No disturbance of vision or hearing was noted. The only complaint was of a feeling of numbness and anaesthesia of the left side of the face. The patient was discharged from the hospital twenty-one days after the operation. She reports that up to the present time, three

and a half years after the operation, there has been no recurrence of pain.

Case VI. John N., aged fifty. Operation: Removal of the Gasserian ganglion by Cushing's method. Death from suppurative meningitis on the sixth day after the operation.

History. A connected history could not be obtained from the patient as he could speak only Russian, and no interpreter could be obtained. From friends it was learned that he had suffered from left trifacial neuralgia for about ten years.

Operation on May 5, 1901. The steps of the operation were practically the same as in the preceding case, the Cushing incision with temporary resection of the zygoma being employed. The opening in the skull was made in the same manner as in the preceding case, no bone flap being retained. The hemorrhage was controlled in the same manner and was not troublesome at any time. The ganglion was readily exposed and removed. The wound was drained, as in all our cases, by means of a strip of iodoform gauze passed down to the bottom of the cavity and brought out at the posterior inferior angle of the wound. The subdural space was not opened excepting where the ganglion was uncovered. The time consumed in the operation was shorter than in any of our previous operations, and there was a minimum amount of trauma to the brain. The patient left the operating table in good condition. During the first three days following he continued to improve. The wound was dressed and the drainage removed at the end of the third day, a second piece of gauze being inserted where the primary drainage had been placed. Twelve hours after the dressing the temperature and pulse began to rise. Delirium with vomiting and rigidity of the neck muscles quickly followed. Death in coma followed on the sixth day after the operation. Autopsy revealed suppurative basilar meningitis

with chronic nephritis and chronic myocarditis. The ganglion had been completely removed.

Case VII. G. B. Referred by Dr. Christianson. Male, aged, seventy-one. Right facial neuralgia of about fifteen years' standing. Resection of right Gasserian ganglion. Meningitis beginning on ninth day after operation. Death on thirteenth day from leptomeningitis. Infection probably from suppurating sphenoidal sinus.

History. About twenty years ago had first attack of neuralgia. At this time the pain was limited to the inferior dental nerve and lasted but a short time. No further trouble was experienced for five years, when pain returned and has continued with increasing severity until the present time. Since 1894 it has involved all three divisions of the fifth nerve being most acute over the supraorbital and inferior maxillary nerves. The paroxysms recur, each beginning with pain in the angle of the mouth on the right side and radiating up the side of the nose and over the eye. Any movement of the jaws initiates severe pain in the temperomaxillary articulation which radiates downwards along the inferior dental nerve to the mental foramen. In 1899 Dr. E. Andrews, of Chicago, resected a large portion of the inferior dental nerve. This gave partial relief for six months. Last summer (1903) the infraorbital nerve was removed at the West Side Hospital. This did not give any relief.

Habits. Uses tobacco excessively, alcohol moderately. Has had to resort to morphine since returning from the hospital in 1903. Now uses about three grains a day. Venereal infection of any kind denied. Has had malaria and rheumatism.

Physical examination. Revealed no abnormal condition of chest or abdomen. Urinary findings were negative, as was also that of the blood. The right side of the face is scarred from previous operations upon the infraorbital and inferior dental nerves. The teeth were all extracted shortly after the pain began.

Operation at St. Luke's Hospital, March 17, 1901. Cushing's modification of the Hartley Krause incision following the technic described in preceding cases. Hemorrhage moderately severe from an accidental wound of the main trunk of the middle meningeal artery caused by tearing the dura and lacerating the vessel while separating the dura from the skull after removing a small button of bone with a trephine. This accident caused considerable delay. The hemorrhage was controlled by double ligation of the vessel. The ganglion was easily reached and freed from its dural attachment. It was grasped with a strong forceps and torn from its bed after cutting the second and third divisions close to their foramina of exit. With the ganglion the major portion of the sensory root was removed. The venous hemorrhage was slight. The sinus was not opened. The wound was drained by a small strip of iodoform gauze, the zygoma replaced and the muscle flap sutured with catgut. The skin flaps were sutured with silkworm gut. The patient left the table in a fairly good condition. The following day the temperature was normal and the pulse about 100. At the end of 24 hours the gauze drain was removed and the skin sutures on the third day. The wound healed by primary union. The temperature and pulse remained normal until the ninth day. The patient after the fifth day was up and walking about the ward. On the morning of the ninth day the temperature registered normal at 5 A. M. At 9 A. M. the patient had a severe chill and complained of headache. The temperature was then 104, the pulse 103. Blood count showed 42,000 whites. From this time on the temperature ranged from 102 to 105, the pulse from 110 to 160. The mental condition was fairly good until a few hours before death. There was no rigidity of the neck muscles at any time. The pupils were equal and both reacted to light at all times. After the initial chill he frequently complained of feeling cold, but had no distinct chill. Death apparently from exhaustion took place on the thirteenth day after the operation.

Autopsy. Within four hours after death, by Dr. Gideon Wells of the Chicago University. A summary of the post mortem findings are: Acute suppurative cerebral leptomeningitis, recent operation wound in right temporal region; defect in sphenoid bone, empyema of sphenoidal sinus; absence of the right Gasserian ganglion, senile pulmonary emphysema, and slight arterial sclerosis.

Bacteriologic examination showed the presence of streptococci and the diplococcus intracellularis.

A rational explanation of the origin of the infection is that is was due to the breaking up of the granulation barrier that alone closed the defect in the lateral wall of the right sphenoidal sinus. That there existed an ancient sphenoidal sinus infection with a defect in the wall of the sinus, apparently from necrosis, there is no doubt. During the operation the wall of granulation tissue that had prevented intracranial infection had been disturbed. Following an acute exacerbation of the chronic empyema infective matter had escaped into the subarachnoid space and caused the meningitis. Immediately following the operation the patient presented symptoms of a mild coryza with a mucopurulent discharge from the nostrils and complained of having taken cold as a result of shaving the head. It is extremely doubtful, though possible, that the infection was carried into the cranial cavity at the time of the operation. Meningitis under these conditions would have developed ordinarily within four days after the operation. The drainage and sutures having been removed early (24 hours and 48 hours) and the primary healing of the wound would argue against this being the source of the infection.

METHODS OF OPERATING.

The operators who first conceived the idea of attacking the trifacial nerve within the cranium were satisfied with simple resection of the nerve (second and third divisions) close to the base of the skull. This operation, as those

upon the branches outside of the cranial cavity, was found inadequate because of the frequent relapses that followed. To Rose, of London, is due the credit of first attempting to remove the Gasserian ganglion and the portions of the fifth nerve between it and their foramina of exit. Andrews, of Chicago, independently devised a method nearly identical with that followed by Rose, but did not operate until some time later.

The steps of the *Rose-Andrews operation* are as follows:

1. A skin incision beginning near the external angular process of the frontal, curved horizontally just above the zygoma, then downward just in front of the ear, terminating near the angle of the jaw.

2. Reflecting a flap of skin and subcutaneous tissue.

3. Sawing through the zygomatic arch and reflecting it downward with the attached masseter muscle. (Fig. 2).

4. The coronoid process is sawn through and turned upward with the attached temporal muscle.

5. Ligation of the internal maxillary artery.

6. Location of the posterior sharp edge of the external pterygoid plate of the sphenoid. The foramen ovale is found near the base.

7. A probe is passed through the foramen and the ganglion is transfixed.

8. A trephine is applied to the base of the skull just external to the foramen ovale.

9. The bone between the foramen and the trephine opening is removed with a Rongeur forceps.

10. The ganglion is removed by curettage.

The dangers of this operation are so great and the disadvantages so apparent that it has been generally abandoned. Among the chief difficulties encountered may be mentioned the small space within which one must work, the abundant hemorrhage that obscures the field of operation, and the arduous, if not impossible task, of reaching the ganglion through this opening in the base of the skull. Hemorrhage from the middle meningeal artery resulting

from a wound received during the operation is frequently a source of trouble and is extremely difficult to control.

The greatest danger, however, arises from accidental injury to the Eustachian tube, which lies in close proximity to the operation wound. In all the cases in which infection occurred, it was from the Eustachian tube. Rose lost one of his cases forty-eight hours after the operation from meningitis, the infection starting from a wound in the tube. Caponotto lost one four days after the operation from the same cause.

Unimportant modifications of this method have been introduced by a number of surgeons. Park employed an H-shaped, Artieda a U-shaped, and Doyen a vertical skin incision. It is extremely doubtful, however, if any who followed this route succeeded in removing the ganglion.

Temporosphenoidal Method of Doyen.—Doyen at first used a modification of the Rose-Andrews method in reaching the ganglion. In 1895 he proposed a new route which he called the temporosphenoidal. This operation consists in making a skin incision similar to that of Hartley's and reflecting a flap which includes all of the tissues down to the bone. The zygomatic arch is resected close to the condyle, the coronoid process divided, and the temporal fossa denuded. A trephine opening is then made at the level of the sphenotemporal suture and all of the bone removed with a cutting forceps down to the foramen ovale. This method, it will be seen, has the advantage that it gives a large operation field and permits the easy removal of the ganglion.

Horsley's Method. The operation devised by Horsley in 1890 consists in making a skin incision starting from the anterior extremity of the zygoma and running upward to the temporal ridge, following that line, and descending along it to the asterion.

A flap, including all of the tissues down to the bone, is then reflected. The temporosphenoidal lobe is exposed by removing the whole squamous portion of the temporal bone

with a trephine and forceps, and opening the dura by an incision corresponding to the opening in the bone. A broad smooth retractor is then slipped underneath the lobe and slowly and steadily raised, thus elevating the temporosphenoidal lobe from the floor of the skull. The guide to the fifth nerve is the upper border of the petrous bone. Elevating the brain a little more, it will show the tentorium and the point at which the nerve passes beneath it can be seen. The ganglion is then reached by following along the nerve, and after it is fully exposed is enucleated together with its sensory root.

This operation proved extremely dangerous because of the injury inflicted upon the brain and the great risk of infection that opening the dura incurs. Hemorrhage from the veins at the base of the skull proved very troublesome and was in one instance sufficient to cause death.

The Hartley Krause Method (Fig. 1.).— The operation that is practiced by nearly all surgeons is that originated by Hartley, of New York, and later employed independently by Prof. F. Krause. As this is the method that has been chosen in the past by most surgeons, its technique will be considered somewhat in detail.

The steps of the operation are as follows:

1. A horseshoe-shaped skin incision having its base at the zygoma, the greatest distance between the two arms being about three inches and the vertical measurements from the top of the arch to the base about the same.

2. Resecting an osteoplastic flap, the bone at the base of this flap being broken well down below the zygoma.

3. Separation of the dura from the floor of the middle fossa.

4. Exposure of the second and third divisions of the fifth nerve as they enter the foramina rotundum and ovale.

5. This step in Hartley's operation consisted in resecting the second and third divisions between their foramina of exit and the Gasserian ganglion. He made no attempt to remove the ganglion.

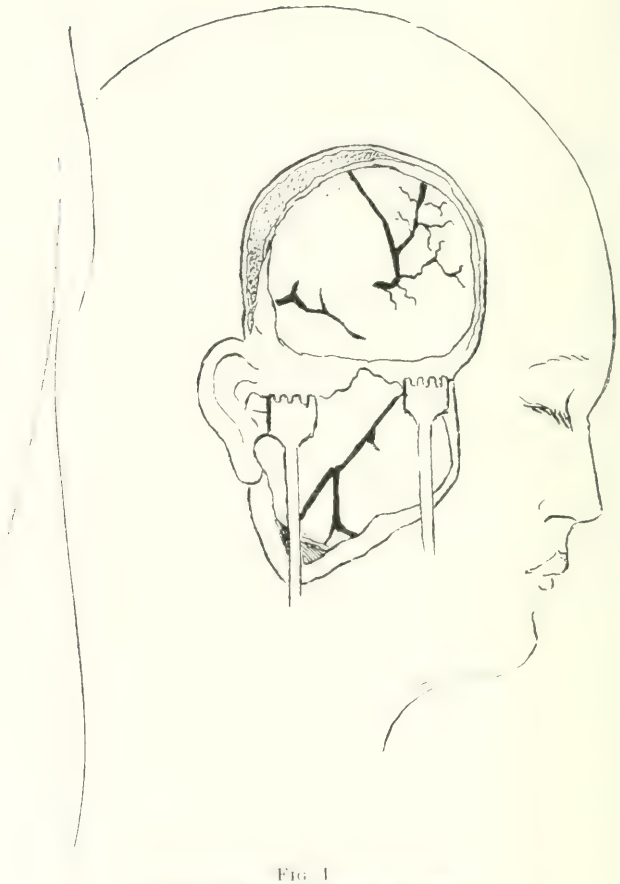

Fig. 1
Hartley Operation. After Hartley

6. Recognition and extirpation of the ganglion. To Krause belongs the credit of perfecting the technique of this step of the operation and of first removing the ganglion by this route.

As soon as the brain has been lifted from the middle fossa and the hemorrhage checked, the second and third divisions can be readily recognized by the folds produced by elevation of the dura. The ganglion lies at the junction of the axes of the second and third divisions. The two branches are uncovered, the dissection being carried upward until the ganglion which rests between two layers of the dura is completely exposed. The ganglion is then seized with a pair of artery forceps, the second and third divisions are divided close to the base of the skull, and the ganglion removed by twisting the forceps.

Difficulties encountered in the course of the operation. In discussing in detail the different steps, as above outlined, the first that deserves consideration is the means to be employed in gaining access to the cranial cavity after the temporal flap has been outlined.

Hartley in his operations used a chisel to cut a groove in the bone corresponding to the skin incision. This groove went only to the vitreous plate excepting at the upper angle, where it went through the whole thickness of the bone. An elevator was introduced at this point and the remaining portions of the bone fractured.

Krause cut through the bone with a small circular saw attached to a dental engine. Keen recommends either Cryel's drill or Pyle's chisel.

The method that we have used and the one that is to be recommended because of the rapidity and ease with which it allows the surgeon to work, is the one adopted by Murphy, and consists in first making a small trephine opening and then cutting the bone with a De Vilbis forceps. After the bone has been cut through along the line of the skin incision, an elevator is introduced underneath the apex of the flap, and the bone fractured along the base

line. The opening is then enlarged by cutting away with the forceps the rough edge of the bone along the line of fracture.

Separation of the dura from the base of the skull can in most cases be easily accomplished. In certain individuals, owing to local peculiarities in the skull, it may be very difficult. This is often the case in the male where the irregularities of the base are accentuated and permit the firm attachment of the dura. In the female the surface of the bone is relatively smooth as a consequenc of which separation is less difficult.

The force that may be employed with safety to the dura varies considerably in different individuals. In some instances it is found greatly thickened and extremely resistant as in a case reported by Eskridge and Baker, where it had nearly the consistency of bone. In one of Richardson's cases the dura was so soft and friable that in spite of all precautions it was repeatedly torn in attempting to separate it from the base.

Tearing of the dura in this step of the operation is, however, not an accident of much consequence. It subjects the patient to an additional risk of infection and permits of injury to the brain. The first danger may be obviated by diligent attention to asepsis, and the second by protecting the brain as much as possible while operating by keeping it covered with dura and by the use of a Hartley retractor in the hands of a skilled assistant.

Tiffany advises incising the dura to allow the escape of cerebrospinal fluid. Richardson incised the dura in one case and claims that the evacuation of cerebrospinal fluid facilitated subsequent maneuvers.

Hemorrhage is by far the most important feature of the operation that we are called upon to deal with. In most cases it can be controlled so as to allow completion of the operation. In a few it is so severe that the surgeon is forced to resort to packing, completing the operation at a subsequent sitting.

In the course of the operation we encounter hemorrhage from a number of different sources. These are:

1. Hemorrhage from the soft parts, principally from the branches of the temporal artery. This is severe for a few moments, but can generally be controlled by pressure and forceps as soon as the flap has been reflected.

2. From the middle meningeal artery, either from the main trunk or from its branches. Hemorrhage from one of its branches, usually the anterior, is not of much importance, and can easily be checked by ligature when the vessel rests in a groove in the bone, or by plugging with catgut or gauze when it is encased in a complete bony channel. Hemorrhage from the main trunk is always profuse and frequently difficult to control. Krause ligates the artery at its exit from the foramen at the base of the skull. This is not easily accomplished and is impossible in case the artery passes directly into a bony channel. In such a case the artery must first be freed by chiseling, as was done by Finney and Czerny. It is possible then to ligate. When the artery presents no anomalous condition the quickest and surest way of checking hemorrhage from its trunk is to plug the foramen spinosum with catgut wool, as was done by Finney, or with a small piece of iodoform gauze.

Fowler recommends preliminary ligation of the external carotid artery as a means of controlling hemorrhage. This procedure has not proven satisfactory as the abundant anastomosis of this vessel with those of the opposite side and with branches of the internal carotid renders it of little value.

of the ganglion impossible. Keen, Krause and others have been forced to pack the wound and delay the completion of the operation until a later day. As the danger of sepsis is greatly enhanced by operating in two steps, every effort should be made to complete the operation in one sitting.

4. Hemorrhage from the cavernous sinus is usually the

result of tearing of the sinus at the moment the ganglion is torn from its attachment. Occasionally the sinus wall is punctured during the process of separation of the dura from the ganglion or when an attempt is made to resect the first division of the fifth nerve.

Hemorrhage from this source, although at times alarming, is easily controlled by packing with gauze; it sometimes necessitates postponement of the operation. The sinus has been opened by Krause, Finney, Abbe and Keen without any serious results. In the case of Charlot,

3. Hemorrhage from the small veins at the base of the skull which are torn as the dura is separated from the bone is extremely troublesome and frequently prevents completion of the operation. It is best controlled by packing the cavity with a strip of gauze saturated in a two-per cent solution of gelatin and then permitting the brain to fall back in place for five or ten minutes. This will quickly control the bleeding and permit the operator to continue. In some cases the hemorrhage from this source has been so profuse and troublesome as to make the removal in which the sinus was punctured, a fatal termination ensued.

The internal carotid artery which lies a little anterior and close to the inner side of the ganglion might easily be injured and thus be a source of fatal hemorrhage. So far this accident has not been recorded; with due care and the use of dull dissection it can always be avoided.

Next to hemorrhage we have compression of the brain as the most serious condition which we should guard against. A slight amount of compression from pressure of the retractor upon the cortex is unavoidable, but rarely occasions any untoward symptoms. This compression can be minimized by use of the Hartley retractor and by care on the part of the assistant whose duty it is to lift the brain. Preserving the dura and the cerebrospinal fluid intact also greatly diminishes the chances of serious cortical compression.

In one of Krause's cases in which the operation was performed for left-sided neuralgia, the patient suffered from slight aphasia for twenty four hours after the operation. In a similar case operated on by Walton in which the dura was torn in several places, and the left temporosphenoidal lobe was considerably lacerated, aphasic symptoms with loss of memory persisted for five days.

Symptoms of general cerebral compression from local pressure influencing the distribution of the cerebrospinal fluid have been noted. In a case operated on by Fowler pressure on the frontal lobe forced the cerebrospinal fluid from the lateral ventricles in the medulla causing alarming dyspnea from disturbance of the respiratory center.

Postoperative compression symptoms have resulted from retention of wound secretions in one of Krause's cases and from secondary hemorrhage after removal of the gauze packing in one of Marchant's. To prevent this accident Krause and Marchant advise the use of tubular drainage in addition to the gauze packing. In a case operated on by Von Beck, in which he twisted the main trunk of the middle meningeal artery pronounced compression symptoms developed on the eleventh day after the operation as the result of secondary hemorrhage from the middle meningeal. The wound was reopened, the clot removed, and the hemorrhage checked by a provisional gauze tampon and the subsequent use of the actual cautery. The compression symptoms then disappeared.

Cushing's direct or infra-arterial method (*Figs.* 2 and 3), a modification of the Hartley-Krause operation, possesses important points of superiority over the original operations as here outlined. The steps of Cushing's operation are as follows:

1. An inverted U-shaped flap five centimeters high, with a base four centimeters wide, corresponding to the zygoma. This is considerably smaller than the flap reflected in the Hartley-Krause operation.

2. Incision of the temporal fascia concentric with the

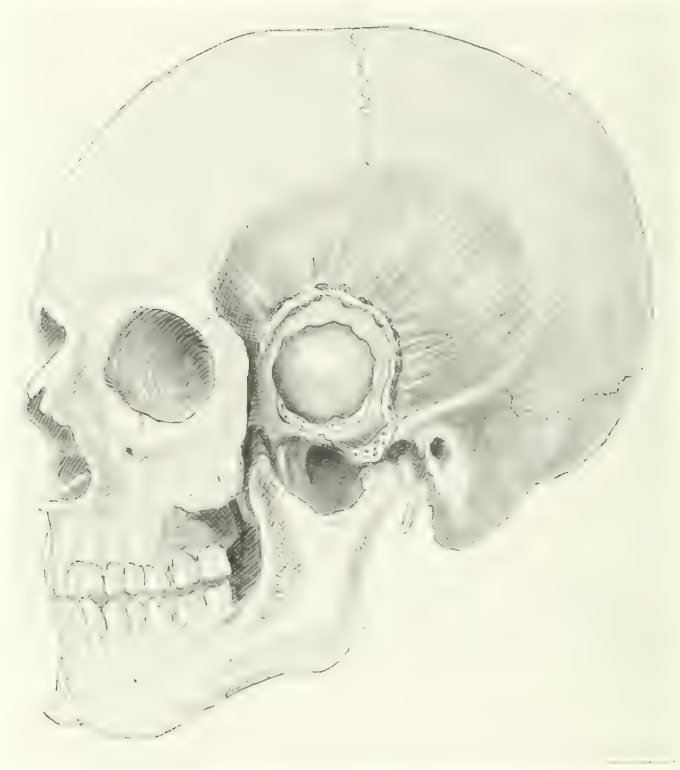

FIG. II.
Opening in Skull. Middle Meningeal Artery. After Cushing.

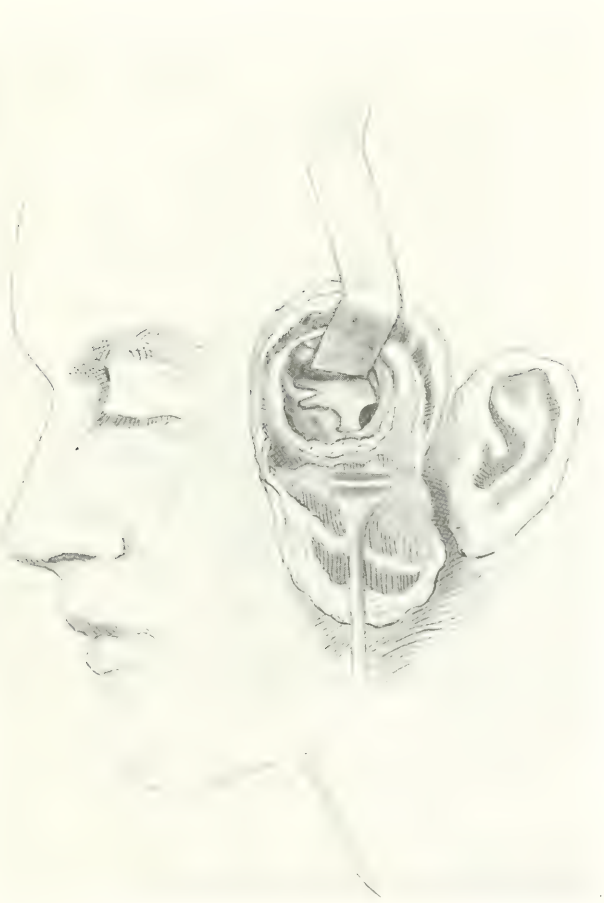

Fig. III.
Cushing's Operation. Ganglion exposed. After Cushing.

skin incision, with subsequent elevation of the periosteum of the zygomatic arch.

3. Division of the zygomatic arch at two points corresponding to the extremities of the skin incision.

4. The temporal fossa is then cleared of the temporal muscle over an area equal to the skin flap. This muscle with the zygoma is then retracted strongly downwards. In this way the lower part of the temporal fossa is exposed as low down as the attachment of the external pterygoid muscle. The skull is then opened at the most prominent part of the great wing of the sphenoid. Cushing prefers a mallet and gouge for making the primary opening. With a Rongeur forceps the opening is enlarged downward to the ridge between the temporal and zygomatic fossae. The middle meningeal artery crosses the center of the opening in the skull.

The succeeding steps of the operation, elevation of the dura, liberation and extraction of the ganglion, do not differ materially from those described under the Hartley-Krause method. In closing the wound, as no attempt has been made to preserve the bone flap, it is only necessary to replace the zygoma and to suture the muscle and skin flap. Cushing does not drain.

We have employed this method in four of our cases, and are convinced that is possesses all of the advantages over the Hartley Krause operation that are claimed for it by Cushing. In our work we found that the hemorrhage from the superficial soft parts was considerably less, as was also that from the venæ Santorini. The ganglion owing to the low position of the cranial opening was much more accessible. The middle meningeal artery, always a source of danger in the Hartley-Krause operation, was not injured excepting in our last case, nor was it a source of anxiety during the most critical part of the operation. Ligation of the vessel, as a routine procedure, considered essential by Krause, was not found necessary.

Our technique differed but slightly from Cushing's.

We make the primary opening in the skull with a small (half-inch) trephine, not at the most prominent part of the great wing of the sphenoid, but half an inch below and anterior to that point, thus avoiding in most cases placing the primary opening over the middle meningeal artery. This opening is then enlarged with a Rongeur forceps below, above, and backwards, first separating the dura for some distance to protect the middle meningeal. In freeing the ganglion the method of Krause was employed in all our cases. Only in the cases operated on by the Hartley-Krause method did we attempt to preserve the bone flap. The small size and low position of the opening in the skull in Cushing's operation, and the protection offered by the replaced zygoma and soft parts obviate the necessity of preserving the bone.

The question of drainage is still open. Cushing does not recommend it. In our cases the amount of oozing that followed seemed to justify this procedure. However, it is unquestionably a source of danger, as was evidenced in our Case VI., where the patient succumbed to a suppurative meningitis from an infection traveling along the drainage track.

EFFECTS OF THE OPERATION.

Anaesthesia.—After removal of the ganglion it will generally be found that the sensation of pain is abolished over an area corresponding nearly to the part supplied by the fifth nerve. Ordinary sensation is affected to a much less extent. The sensation of heat and cold is frequently perverted. The area of complete anæsthesia, however, quickly diminishes in size after the operation, the periphery first regaining sensation.

In a case examined by Krause two years and three months after the operation in which, immediately following, the anæsthesia was typical, the limits of the anæsthetic area were far less clearly marked and its size was greatly diminished.

In two of Tiffany's cases, one examined two years and four months, and the other three years and eight months after the operation, the anæsthetic area in each was considerably diminished in size and changed in outline. Von Beck noted the return of sensation to the periphery of the anæsthetic zone fourteen days after removal of the ganglion.

In our Case I. the area of total anæsthesia had diminished in size during the first two years after the operation until it was but slightly larger than a silver dollar. In the remaining portions of the previously anæsthetic area, which corresponded to the distribution of the fifth nerve, sensation was not wholly restored. Five years after this the conditions remained practically the same.

Motor disturbances.—In nearly all the cases the motor root of the fifth is divided with the inferior maxillary division. As the muscles of mastication are supplied by this nerve, they are consequently paralyzed after its division.

This paralysis is of little consequence, as the muscles of the opposite side sufficiently assume the functions of those paralyzed to cause but little inconvenience to the patient. Paralysis of the buccinator is, of course, never complete, as it derives its nerve supply from two sources, the facial and the fifth.

At times after removal of the ganglion there exists to a greater or less degree ankylosis of the temporomaxillary articulation. Quénu considers this to be the result of trophic changes with secondary contraction of the temporal and masseter muscles. It may also be due to direct injury at the time of the operation to these muscles or to the temporomaxillary articulation. As a rule, this difficulty quickly disappears and only in a single case has it called for operative treatment. In one of our patients, Case IV., ankylosis, probably due to the contraction of periarticular fibrous tissue, followed the Cushing operation. At the end of six months the patient was able to

separate the teeth only a half an inch. Since then his condition has greatly improved, although the ankylosis has not entirely disappeared. The joint cavity was not opened at the time of the operation.

Effects upon the eye. In all cases where the ganglion has been removed, there will be complete corneal and conjunctival anæsthesia. This of itself is of little importance. At times, however, ulceration, opacity and softening of the cornea follow destruction of the ganglion or the intracranial division of the nerves. In a few cases panophthalmitis has resulted, necessitating enucleation. This occurred in cases operated on by Keen, Krause, Rose and Tiffany.

The cause of the eye lesions has as yet not been definitely settled. Most physiologists have heretofore regarded the fifth nerve as the trophic nerve of the eye, and on these grounds surgeons have attributed the loss of the eye to trophic changes. Experiments made by Glye, Ferrier and Turner, go to prove that the trifacial exerts no trophic influence over the eye, and that when destruction of the eye follows removal of the ganglion it is the result of infection and trauma which the anæsthetic condition of the cornea favors. After a number of experiments on animals Turner concludes that "there is no evidence of trophic influence exerted by the Gasserian ganglion upon the cornea, and that provided septic organisms are excluded the ophthalmic branch may be safely divided or the Gasserian ganglion removed without fear of disorganization of the eye."

Doyen states that the loss of the eye in animals after division of the trifacial is always due to trauma, and that the sympathetic alone presides over the nutrition of the eye. Spiller, Van Gehuchten, and others have shown that sympathetic fibers probably enter the fifth nerve through the ganglion and are distributed to the parts supplied by the trifacial. That these fibers preside over the nutrition of the eye has not yet been definitely proven.

It may be remarked, in support of the theory that eye lesions are due to trauma and infection, that in the cases reported where the eye has been properly protected during and after the operation, corneal ulcers or loss of the eye have not been reported.

In every case the eye should be covered with an occlusion dressing during the operation and carefully protected for some time afterward. Krause advises the use of atropine before and after the operation with daily irrigation of the eye with boric acid solution. Keen recommends closing the eye by means of adhesive plaster strips attached to the lids, or by suturing the lids after freshening the margins at one place. In none of our cases did any serious eye symptoms follow removal of the ganglion.

Dryness of the cornea from arrest of the secretion of tears, attributed by Krause to destruction of the great superficial petrosal nerve, also acts as a predisposing cause of corneal ulceration. This can be remedied in part by frequent irrigation of the eye and, as von Hippel recommends, by keeping the patient in a moist atmosphere.

Paralysis of the eye muscles with ptosis from injury to the third, fourth and sixth nerves as they pass through the external wall of the cavernous sinus, has in several instances been noted. These nerves have usually been injured when an attempt has been made to divide the ophthalmic division of the trifacial. The paralysis following injury to these nerves has been fortunately in most cases of short duration, disappearing, within a few weeks.

Effects upon the ear.—After removal of the Gasserian ganglion there may be complete or partial loss of hearing on the affected side. This may be the result of paralysis of the tensor tympani, which receives its nerve supply from the motor root of the fifth, or from edema of the tympanic membrane as a consequence of the vaso-motor disturbance that frequently follows division of the trifacial. Occasionally suppurative inflammation of the middle ear ensues; this is due to infection of the serous

exudate in the middle ear which is present as the result of vasomotor paralysis.

Paralysis of the seventh nerve, complete and permanent, followed the partial removal of the ganglion in a case operated on by Harry Sherman. Although the operator was unable to offer any explanation of its occurrence, it was probably due to pressure made upon the extracranial portion of the nerve during the course of the operation.

Relapses.—Recurrences of pain after removal of the Gasserian ganglion have been recorded by Rose, Keen, Krause, Dana, and others. In Rose's case the attempt at removal of the ganglion was made by the transmaxillary route, which would preclude the possibility of a complete operation. In Keen's cases the Hartley-Krause method was employed but the ganglion was not removed in its entirety, being only broken up and fragments scraped away. In Carson's and Tiffany's series of 208 cases there were twenty-one failures. In reviewing these, in but six cases was Carson satisfied that the ganglion had been removed completely. In three of these the pain was insignificant. In Friedrich's case the operation was complicated by an excessive hemorrhage necessitating tamponing of the wound twice. The ganglion he claims was removed completely. Pain returned immediately, but not so severe as before the operation. Four months afterwards the pain was intense over the entire area supplied by the nerve on the side of the operation. Later it extended to the opposite side as well.

Garré's case, previously referred to, is given as another example of recurrence after complete removal of the ganglion, although he states that sensation was retained over the area of distribution of the first and second divisions of the nerve. The part supplied by the third division alone was anesthetic. Pain returned immediately, most severe in the second and third divisions. One and a quarter years after the ganglion was removed the pain continuing, he re-opened the skull and found only a con

nective tissue thread that passed into the foramen ovale and became lost on the dura. This he removed with some scar tissue but failed to find any ganglion cells in it on microscopic examination. The foramina ovale and rotundum were then closed by plugging with fragments of bone loosened from their borders by means of a chisel. Pain again recurred after fifteen months. The patient was subsequently subjected to a number of peripheral operations which ultimately gave relief from the pain.

In our third case there was a recurrence of pain of slight degree compared with that experienced before the operation. Immediately following the operation the region supplied by the first division was not completely anesthetic; the parts supplied by the second and third divisions were absolutely anesthetic. After two years the anesthesia remained practically as complete as it was immediately after the operation. At this time the patient complained of pain just below and behind the orbit, although pressure over the infraorbital foramen did not cause pain. The skin in this region was totally anesthetic. The tissue removed in this case was examined by Dr. M. Hertzog, who found a nearly intact ganglion with but slight change from the normal in the ganglion cells. The patient, when examined two or three years after the operation, was decidedly neurasthenic and seemed to suffer more from dread of recurrence of the former pain than from the actual conditions existing.

From the cases here reviewed and from our own experience it seems possible to have a return of the pain after removal of the ganglion. Nevertheless, we believe with Cushing that "the probability of non-recurrence bears a direct relation to the degree of entirety with which the ganglion has been removed." In our own cases we had each ganglion subjected to a careful examination by a competent pathologist. In all of the specimens submitted ganglion elements were found and the gross anatomical characteristics of the organ were preserved.

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CEREBAL TUMOR; REMOVAL IN TWO STAGES BY THE OSTEO-PLASTIC METHOD; SUBSEQUENT WIRING OF BONE-FLAP; INTRODUCTION OF A GOLD PLATE.

JOHN E. OWENS, M. D., ATTENDING SURGEON.

A woman, A. K., aged 30, was admitted to St. Luke's Hospital Aug. 25, 1904. There had been a gradual failure of vision, the diminution being more rapid on the right side, until, at the date of admission to the hospital, she could barely distinguish light with the right eye, and could only make out shadows from large objects with the left.

Nearly five years ago a hard lump, osteoma, the size of a walnut, appeared in the right parietal region. During three years it grew to the size of the fist, and it was of this size at the time of removal by Dr. J. S. Reeve of Appleton, Wis., about eighteen months before admission. She had been troubled more or less with sick headaches since childhood, chiefly frontal and lately occipital, and also during that period she had rheumatism, scarlet fever, measles and diphtheria.

In addition to the dimness of vision and headache, Miss K. has noticed failing memory; numbness with tingling beginning in the fingers of the left hand and creeping up the arm, varying as to time, but usually lasting about half an hour; vertigo and vomiting frequent; tenderness over the scar. Her appetite and sleep were usually satisfactory; weight 105 pounds; no gain or loss; constipation; menstruation, which began at fourteen, regular; family history negative.

She went out with difficulty, and fell a number of times in consequence of defective vision and dizziness. During childhood the headaches were very severe. The vomiting sometimes lasted nearly half a day. The attacks occurred almost daily. She suffered in this way until Aug. 24, 1904, although not so severely as in childhood.

Physical Examination.

(a) General.—Color healthful; patient cheerful; well nourished; strength and development fair; right hand grasp somewhat stronger than that of the left; papular eruption on chest, shoulder and arms; shape and movements of chest normal; hallux varus on both sides.

Head.—The skull was abnormally prominent at the site of the operation for the removal of the osteoma; vessels of the scalp largely dilated.

(b) Special Examination.—No deviation of tongue; pupils dilated; cannot count fingers with the left eye at a distance of six feet.

The following is the report of Dr. Paul Guilford's examination of the eyes: "Tested together both pupils responded quickly and equally to light, but when left uncovered the right pupil dilated and did not respond to light. Vision of right eye was reduced to simple light perception; vision of left eye 20-50; not improved by glasses; media clear; marked choked disk of both eyes, especially of the right, where nerve had swollen eight diopters; left nerve swollen five diopters; no retinal hemorrhage. Optic atrophy will surely follow; prognosis very bad." He did not think vision would be improved by removal of a tumor.

Touch and sensation were apparently normal; reflexes responded readily on the right side; knee, biceps and triceps reflexes exaggerated on left side; no Babinski; no ankle clonus.

The following diagnosis was arrived at: Intra-cranial tumor, probably an osteoma, growing from the inner sur-

face of the skull beneath the site of that above referred to. Dr. Archibald Church saw the case in consultation, and concurred in the diagnosis of brain tumor in the location of the osteoma removed by Dr. Reeve.

The operation was set for Aug. 30, 1904.

Technique. After a final table preparation of the head, the upper and lower extremities of the Rolandic fissure and the middle meningeal artery were located. A large horse-shoe shaped flap was outlined by incision in the parietal region on the right side, the base or pedicle looking downwards, the flap being made narrower at the base for convenience of subsequent operative steps; scalp separated from the bone, leaving about one inch of bone surface exposed, previous to making four small trephine openings in the skull, one on either side at the pedicle and one on either side of the upper portion of the flap, with a view of dividing the intervening bone. The hemorrhage from the scalp was very profuse and very difficult to manage. In spite of the fact that the head was encircled with an elastic band, hemorrhage persisted even after a number of artery forceps had been employed. These, as well as digital compression here and there, were not sufficient to completely arrest the bleeding. In other words, the moment the pressure was relaxed the hemorrhage was renewed.

The trephining was completed, and the intervening bone, between the two upper trephined holes, divided with considerable difficulty, as the bone was half an inch thick and devoid of diploic structure, so that the division of the skull by rongeur forceps was very tedious. At this stage the patient's condition became so alarming, chiefly from loss of blood, that it was thought best to abandon the operation for the time being. The wound was quickly closed by continuous suture. The prostration was extreme, and great difficulty was experienced in carrying the patient through the next twenty-four hours.

She had, however, so far improved that the second stage of the operation was performed on Sept. 6th.

Technique. A thorough table preparation; rubber constrictors placed around the head; scalp readily pulled apart at the line of incision. Bleeding immediately became scalp at the pedicle for the purpose of enclosing the latter in an elastic ligature. The division of the bone-flap, by means of rongeur forceps, became very tedious and discouraging until, by means of a burr-head drill, the skull was thinned sufficiently to allow the biting forceps to proceed more rapidly.

The bone-flap at the pedicle was partially divided by means of Gigli saw having been passed beneath, and the underlying parts protected by means of F. C. Schaefer's Protector. Moderate force completed the division by fracture, when the osteo-plastic flap was readily turned down, exposing the dura. There was an opening in the dura at the upper right hand segment of the exposed portion, filled with a soft tumor-like substance. This opening was enlarged sufficiently to introduce two fingers, by means of which soft, light purple material was removed from a surrounding capsule. The tumor-like substance was of the consistency of shad roe. Several sutures were placed in the dura and the tumor cavity packed with iodoform gauze. No effort was made to remove the capsule. The osteoplastic flap was replaced, iodoform gauze drains brought out at dependent portions of the incision, the scalp wound sutured, constrictor removed, and large dry-dressing applied. Patient was in fairly good condition upon her return to the ward, but two hours subsequently the pulse became very feeble, almost imperceptible, and her condition in general required close attention. The next day, however, there was marked improvement.

At the first dressing on the 8th there was a slight amount of purulent discharge at the lowest drain opening. Sept. 20th all the stitches were removed. There were four points in the scalp from which there was a discharge, viz.,

at both lower segments of the flap, a point where the tumor was situated, and the middle of the posterior leg of the incision.

It was observed at the dressing that the osteo-plastic flap was elevated 1½ cm above its normal level. It was, however, easily pressed into position without resulting cerebral symptoms. A hernia cerebri had developed, but it was easily reduced, and it was thought that it could be made to disappear by means of compresses of iodoform gauze and other dressings kept in position by a strip of adhesive plaster, and over all a Martin's bandage was applied for the purpose of keeping the bone flap in position. Peroxide was directed to be used through the drainage openings beneath the scalp, followed by irrigation with normal salt solution.

We found that the elastic bandage was not borne well —not that it produced brain symptoms, but the pressure around the jaws became distressing and it became necessary to discontinue its use.

Sept. 26th the discharge had diminished. As there was no tendency toward bone union in the skull, and without such pressure as the patient was unable to endure, it seemed impossible to prevent the reappearance of the hernia cerebri and the further elevation of the bone.

Sept. 26th the following final operation was performed: Drilling the skull; insertion of a 22-karat thin gold plate beneath the edges of the bone and over the cerebral protrusion setru were introduced; flap pressed into as close apposition as possible and wire twisted; edges of scalp-wound freshened with scissors; scalp sutured; dry-dressing with gauze drain.

Oct. 1st there was some transient numbness in the left hand.

Oct. 4th, interne in charge, while using peroxide along the scalp, accidentally forced some beneath the skull. Immediately the patient complained of numbness in the entire left side of tongue, with severe pain in the head.

The numbness disappeared in a few hours, but the headache lasted over a day.

The tumor proved to be a cerebral, round-cell, capsulated sarcoma. It spread out over the dura for a short distance, some sharp fibers from the skull running into it. The skull was hypertrophied and the diploic space obliterated. The operation was negative as was predicted, so far as vision was concerned.

Patient stated that objects were recognized with the left

Fig. 11

eye as she formerly saw them on a very dark night, and that she could not distinguish night from day.

"The histological structure of the tumor is that of a small spindle cell sarcoma, with a considerable amount of intercellular substance. The tumor cells seem to be arranged more or less into bundles interwoven in different directions, thereby giving a variety of form to the nucleus, depending upon whether the bundles are cut transversely, obliquely or longitudinally. But by referring to Fig. 2,

under high magnification, where the cells are cut in a longitudinal direction, one can see the characteristic spindle formation." (Dagg.)

"There are no giant cells to be found. Fine trabeculæ of connective tissue, which is very vascular, extend into the tumor from the periphery, and the vessel walls in this connective tissue are very well formed. But those in the tumor proper have very thin walls or none at all, in some cases showing an endothelial lining with the sarcoma cells

Fig. I.

in close contact; in others only a blood space in which not even the endothelial coat can be made out. See Fig. 1." (Dagg.)

Sept. 23d: Pathological Report of a fragment of the cerebral protrusion: "Fibrinous exudate unorganized; leucocytic infiltration; infection—diplococci." (Dagg.)

For the first operation, Aug. 30th, chloroform was employed, and later ether was substituted; for the second,

chloroform; morphia, $\frac{1}{4}$ of a grain, given hypodermically just before the administration of the anæsthetic.

The patient left the hospital November 4th. Nausea, vomiting, headache and dizziness had disappeared.

On Dec. 6, 1904, Dr. Reeve wrote me as follows: "I am glad to tell you that the patient seems to be doing well. Silver wire was removed without difficulty two weeks ago. There is a small bit of bare bone visible at present. This is disappearing, and the wound requires dressing only every four or five days. Vision not changed; arm and leg are no worse; condition excellent; no temperature or œdema; appetite good; patient looks well; no portion of the gold plate is visible."

I have received two letters from the patient, the last one written Dec. 10, 1904. She stated that the head did not pain, but sometimes there was a momentary throbbing. She further informed me that her appetite was good and she slept very well. The arm and leg had not troubled her since the headaches and vomiting ceased. There was no change in the vision, but artificial light was somewhat annoying.

THE ESMARCH BANDAGE IN GYNECOLOGY.

WILLIAM CUTHBERTSON, M. D.

Everyone who has had any experience with the operative treatment of Uterine Liomyomata has undoubtedly been impressed with the varying vascularity of these tumors.

In one form, of a firm consistency, white glistening color, showing a preponderance of the fibrous constituents, the blood vessels are usually small and easily controlled. On the other hand when the muscular elements predominate the tumor is deep red in color, softer to the touch, and the blood vessels are large, numerous and well distributed over, and through the tumor.

In this form of growth the patient has usually been subjected to profuse and long continued hemorrhage, resulting in a greater or less degree of anæmia. It is a well known fact that these anæmic patients do not make good subjects for operation, being particularly prone to surgical "shock" and making tardy convalescents.

Having one of these patients, a victim of large vascular uterine liomyomata, to operate on and being unfavorably impressed with her anæmic condition, I sought to devise some means to lessen the loss of blood to the patient during the operative removal of the tumor. I had been particularly impressed in the past, not only during my own operations, but also in watching the work of other gynecologists, with the amount of bleeding from the uterus and tumors after the broad ligaments had been severed in performing hysterectomy. When this bleeding had been controlled by the use of hæmostatic forceps, there still remained a considerable volume of blood in the severed

uterus and tumor masses, the amount varying, of course, with the size and vascularity of the parts removed.

Anything, therefore, which would retain this blood in an already exsanguinated patient should redound to her benefit, by lessening shock, promoting convalescence and helping the economy to resist any infection which might be introduced at the operation.

I decided on the use of the Esmarch bandage, the beneficial results of which the following report of a case will show:

Miss I. J. admitted to my service in St. Luke's Hospital for removal of large uterine liomyoma.

Blood examination: Hemoglobin 55%; red. corpuscles 3,430,000; white corpuscles 9,400.

Operation: Hysterectomy (Supra vaginal), Double Salpingectomy, Left Oophorectomy.

Medium incision, adhesions about left adnexa broken, peritoneal cavity walled off, uterus with large fibroid tumor delivered and Esmarch bandage applied, volsellum forceps being applied to different parts of the tumor to prevent the Esmarch bandage slipping. An examination of the tumor after its removal showed it to be thoroughly exsanguinated, very little blood escaped from the uterus and tumor during the removal, and the patient was absolutely free from surgical "shock." She made an uninterrupted recovery, the highest post operative temperature being 100.8 F. on the second day, and the highest pulse rate was 100, on the same day.

The cut surfaces of the tumor showed no degeneration, malignant or otherwise nor have any systemic symptoms appeared subsequently, to show the dissemination of any malignant or septic foci.

The patient's general health has been much benefited by the removal of the tumor.

The pathologic examination showed "myoma of the uterus, multiple adhesions about left tube and ovary, with

small cyst of ovary and distortions of right tube by growth of tumor."

The following are the objections to the use of the Esmarch bandage:

First, the difficulty of keeping the ordinary hospital bandage absolutely sterile. This can be overcome by providing a special bandage for use in these cases, and having it unwound before putting it in the sterilizer.

Second, pressing out from the uterus or tumors any septic or malignant processes which may have developed prior to the time of operation, and setting them free in the general circulation.

According to Cullen sarcoma only occurs in this form of uterine tumor in about two per cent of the cases. In regard to carcinoma, Kelly states "when we review the large number of cases of myoma of the uterus, it would be surprising if the one were not at times associated with the other. The liability of myomatous uteri to cancer, is however, manifestly lessened by the fact that the patient is often sterile, and is spared the traumata of parturition which afford an anatomical basis for the cancer." In the majority of cases, however, there would be symptoms which would make us suspicious of carcinoma and prevent the use of the bandage.

An infected condition of the tubes and ovaries, as well as a degeneration of the tumor itself would also contraindicate the use of the Esmarch bandage.

With these limitations, there is still a large number of cases in which in my opinion, the Esmarch bandage could be applied with benefit to the patient and satisfaction to the operator.

BUILDING A NEW URETHRA.

By E. C. Dudley, M. D.

Gynecologist to St. Luke's Hospital.

Hypospadias is usually a congenital defect. It may however, result from traumatism, that is, the urethro-vaginal wall may be surgically divided or may slough out in consequence of pressure necrosis in labor. Whatever the cause

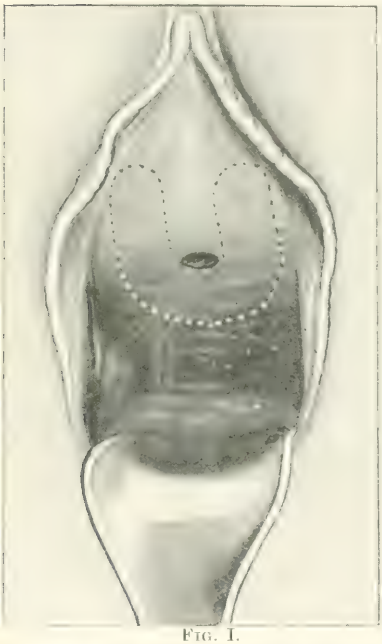

Fig. I.

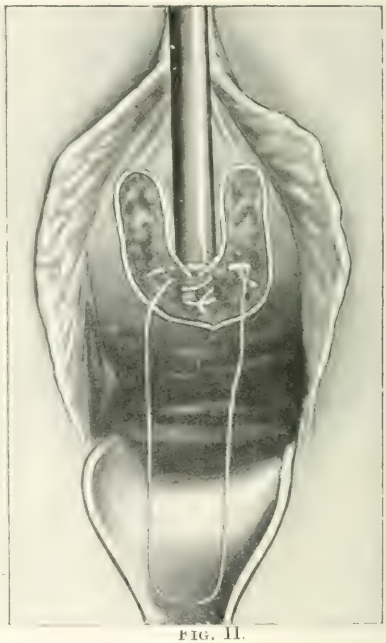

Fig. II.

of the condition may be, if there is incontinence of urine, a plastic operation should be made to construct an artificial urethra. Emmet was the principal pioneer in this operation. His method was to utilize the labia minora as material out of which to make the new urethra. He denuded a longitudinal strip on the inner surface of each labium, and then united them by means of interrupted sutures, and in this way was successful in securing more or less retentive power. The writer has for several years em-

ployed a somewhat different method with gratifying results. Dudley's Principle and Practice of Gynecology, 4th Edition, page 519. This method is illustrated in Figures 1 to 4.

Figure 1. Building of a urethra. Congenital or traumatic absence of urethra. Black and white dotted lines indicate area to be denuded in the construction of a new urethra.

Figure 2. Building of a urethra. Same as Figure 1.

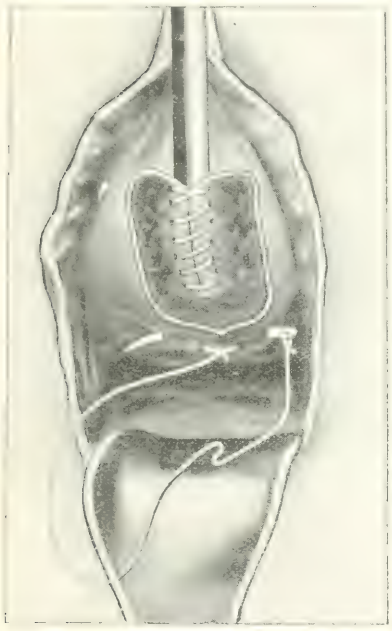

Fig. III.

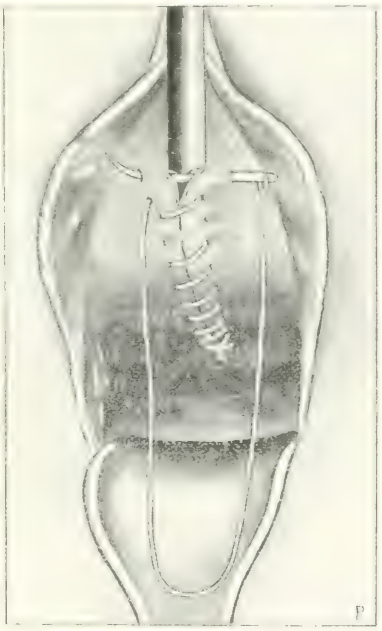

Fig. IV

Area for construction of a new urethra denuded. Inner margins of denuded area being brought together by continuous catgut sutures so as to unite those margins over the sound, which has been introduced into the bladder and is held by the hand of an assistant.

Figure 3. Building of a urethra. Same as Figure 2. Margins of a new urethral mucosa have been united over the sound by fine continuous chromic catgut suture. The

first stitch has been introduced and tied and the needle is being introduced for the second stitch to unite the outer margins of the denuded area for the completion of the new urethra.

Figure 4. Building of a urethra. Same as Figure 3. Sound in position as in Figure 2 and 3. Last stitch of a continuous suture being introduced. This stitch when tied will complete the formation of the new urethra.

It is important in building up a new urethra to have in mind three special points: first, to introduce the sutures over a rather small sound, for the urethra will usually dilate, and, if a large sound is used, will therefore finally become too wide; second, broad areas of denudation should be made on each side so as to produce a very thick urethrovaginal wall, for this wall usually grows thinner by stretching or absorption and therefore should be quite thick to begin with; third, before the new urethra is attempted an artificial vesicovaginal fistula should be made midway between the inner extremity of the urethra and the cervix uteri, so that during the healing process the sutures in the new urethra may not be disturbed mechanically by the outflow of urine. After union in the reconstructed urethra has become solid the fistula may be closed in the usual fashion.

The following case was one of extensive sloughing of the soft parts after labor and due to pressure necrosis which caused destruction of most of the cervix uteri and of the greater part of the vaginal walls. The patient menstruated with more or less irregularity through a narrow and short cicatricial canal. There was laceration of the perineum involving the sphincter and muscle and destroying completely the patient's ability to retain the contents of the bowel. The entire urethra had sloughed away so that the urine constantly and involuntarily passed from bladder to the vagina through a fistula situated near the pubes. It was not deemed practical to attempt any operation for repair of the sloughed out cervix uteri nor

for the vaginal atresia, this latter being so extensive as practically to have obliterated the vagina. Accordingly after closure of the perineum a successful attempt was made January 4, 1901 to construct a new urethra, that is to overcome the traumatic hypospadias. The operation was performed after the manner above described.

After the stitches had been removed from the urethra it was found to be anatomically to all appearances normal and to enable the patient to retain the contents of the bladder for a considerable time when lying on her back, but when standing or walking the retentive power was not wholly satisfactory. Subsequently, however, an ingeniously constructed pessary was introduced by Dr. Fletcher of Winnetka, which by exerting pressure upon the urethral wall closed the urethra in such a way as to give the retentive power. The patient has worn this pessary for a year or two with much satisfaction.

...Private Rooms...

The private rooms of the Hospital are maintained for the benefit of those who desire superior accommodations and are able to pay the Hospital charges in full.

The reputable and otherwise acceptable physicians of the city are invited to treat their patients in the private rooms. They will have at their disposal all the facilities of the institution.

RATES:

Rooms (2 and 3 beds), $12 to $14 each bed per week. Single rooms $16 and upward per week. Special Nurse, undergraduate, $15 per week. Special Nurse, graduate, $25 per week.

Rates are the same whether the patient be a child or an adult.

The rates named include room, board, ordinary medicines and dressings, the services of the nurse of the ward, and of the House Staff. All fractions of a day will be charged for as a day.

An extra charge will be made for examinations made in the Pathological Laboratory, for the use of the operating room, for the services of special nurses when they are required, either by order of the Attending Physician or Surgeon, or to meet the demands of the patient, and for all extraordinary articles of diet, wines, medicines, apparatus, dressings, etc.

Friends of patients will be accommodated with room and board (the regular bill of fare only) when conditions will permit. The rate for any room will be the same as though occupied by a patient.

Personal clothing will not be furnished patients, nor will patients' clothing be laundered.

The Hospital will not be responsible for money or valuables unless they are deposited in the office for safe keeping.

Visitors will be admitted between the hours of 10 a. m. and 9 p. m., unless their presence is deemed prejudicial, to the welfare of the patient.

Complaints should be made direct to the Superintendent.

All bills are payable strictly in advance.

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The maximum rate is $8 per week. In cases where circumstances warrant it a reduction is made, and a certain proportion are admitted free.

AS TO FEES:

Pay patients should make their own arrangements as to fees with the members of the Medical Board by whom they are treated.

"No member of the Attending Staff will make any charge for professional services for attendance upon any patient who does not pay in full the Hospital charge for board, room and nursing; where the patient is nominated by the endower of a bed or room, but is nevertheless able to pay for the services of the physician or surgeon in charge, physicians' or surgeons' fees may be charged, if in the discretion of the Hospital authorities it is thought just and proper.

"The services of the Attending Staff are gratuitous to all patients who, in the judgment of the Hospital authorities, are unable to pay for the same.

"No officer, interne, nurse or servant is allowed to receive any fee or gift from a patient without the formal permission of the Board of Trustees."